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To Hell and Back — Poltergeist II 4

In 1982, all hell broke loose in the Freeling household. Steven Spielberg's production of *Poltergeist* recounted the chilling tale of a family turned upside-down by ghostly goings-on engineered and executed by Oscar-winner Richard Edlund and his visual effects team at Industrial Light and Magic. Now, four years later, *Poltergeist II* finds the beleaguered Freelings once again embroiled in a multidimensional melee — this time without producer Spielberg or Industrial Light and Magic, but with Edlund still at the visual effects helm. Faced with the challenge of surpassing his own previous efforts, Edlund and his Boss Film Corporation — comprised of many veterans from the earlier production — redefined the nature of supernatural filmmaking, bringing to life in the process an array of horrific new phantasms conceived by surrealist designer H.R. Giger. *Article by Nora Lee and Janine Pourroy.*

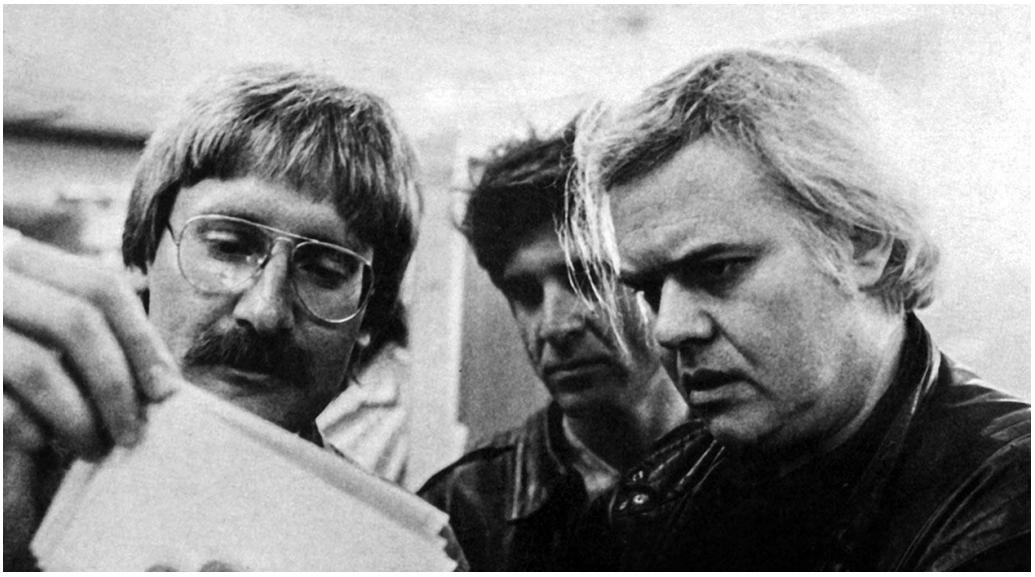
Young Sherlock Holmes — Anything But Elementary 36

Heading the ranks of cinematic supersleuths for decades has been the constant, ever-brilliant epitome of logic and clever deduction — Sherlock Holmes. As the latest entry in the Holmesian film chronicles, *Young Sherlock Holmes* — directed by Barry Levinson for Amblin Productions — presents a portrait of the fledgling detective as a teenager obsessed by a string of baffling murders. Veteran physical effects expert Kit West, first-time animatronics supervisor Stephen Norrington and the cinemagicians at Industrial Light and Magic were called upon to create the film's innovative special effects — ranging from flying machines and murderous hatracks to bizarre hallucinations requiring high-tech computer graphics, go-motion puppet animation and sophisticated rod puppeteering. *Article by Jody Duncan Shay.*

FRONT COVER — Ectoplasmic manifestations mystify Carol Anne in *Poltergeist II.* A menacing stained glass knight from *Young Sherlock Holmes* — BACK COVER.

TO HELL AND BACK POLTERGEIST II

article by
Nora Lee &
Janine Pourroy

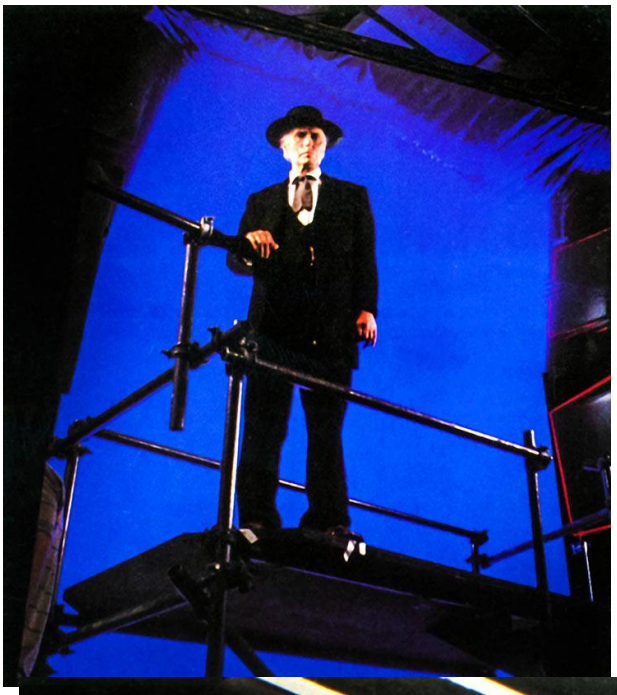


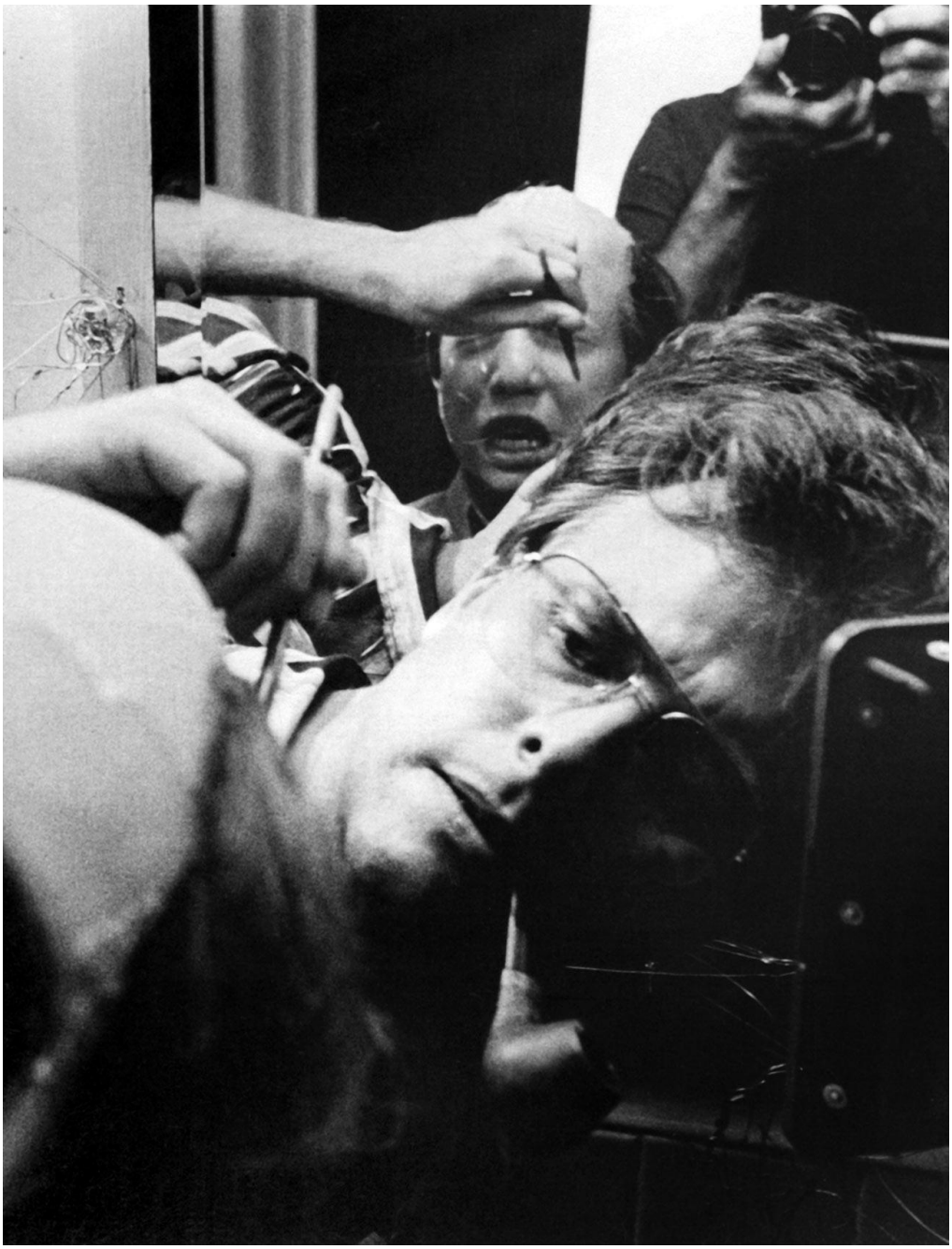
At first, because the day was bright
stage was black, it was hard to distinguis
accustomed to low light, and soon th
became clearer. Stretched across a fra
and maybe six feet wide was a rubbe
twisted faces and bizarre body parts. Be
it were other twisted body parts — thc
puppeteers engaged in bringing this mc
sequel to the American nightmare, *Poll*

In 1982, moviegoers were introduced
and their very unusual suburban home. I
and we loved it. Now, as Carol Anne
back" — the Freelings, the ghosts an
monsters. In the first film, their nice
leaving Steve Freeling, his wife Diane,
Carol Anne homeless. The sequel pick
family's multidimensional melee when
psychic from the first film — discovers
the Freeling house ruins in Cuesta Verde
aid of her shaman friend, Taylor, to dete
found, Taylor's inspection of the site
"Where is the family now?" — and the
production of *Poltergeist II* is off and r

The Freelings have relocated to Phoe
now share a home with Diane's mothe
seems the evil that was disturbed in C
film has followed the family into the se
Poltergeist II is made up of a Victorian
Kane and the stricken souls of his follow
light of Carol Anne's life force. Kane beg
in a shopping mall early in the film
jeopardy until the final moments. Evil i
defeated by good, but a major portion o
the diabolic Kane — whose various mar
only the ghostly preacher but also ecto
worm monster and the great beast — an
family apart.

All the original Freeling family cast n
Craig T. Nelson is once again Steve, wh
come his self-doubt and, in the film's cli
the purgatory-like astral dimension to
family. JoBeth Williams again appears as
for her family overcomes her fears of
Robbins and Heather O'Rourke are the Fr
and Carol Anne. Even E. Buzz the dog is
and Tobe Hooper are not. The special
reprised by Richard Edlund and the exper
tion. Edlund has always been particular
the original *Poltergeist*. For him and fo





the inherent hazards of dealing with live bees as well. You can imagine how messy and difficult it would have been to get a good take as the actors are getting soaked down into this goop — and then trying to do retakes and those kinds of things on top of that. It was a pretty horrific idea, but for practical reasons it just didn't work out. I frankly think what we came up with worked even better. Instead of the evil force making trouble with the lava lamp, it causes Robbie's braces to become alive."

Wide shots for the orthodontic nightmare were accomplished at M-G-M, but the closeups and several inserts were photographed onstage at Boss by Bill Neil. "The sequence begins with Robbie — who has lingered upstairs in his bathroom while the rest of the family is in the den — in a quiet kind of moment. Then suddenly, his braces start coming out of his mouth and up over his face. There's a cut to the family downstairs where they can hear his muffled shrieks, and then back to Robbie who is now stuck on the ceiling and completely surrounded by braces. His parents break into the bathroom and the braces leap onto his dad's arm as he tries to save the boy. There's also a battle when the braces material snakes around — with his mom holding on — and heads for a light socket. Our main job was to get the braces to initially grow out of the boy's mouth in a highly-detailed closeup. It was a *really* tight shot using a remarkable head sculpture made by Randy Cook — one of the most amazing closeup heads I've ever seen. Instead of the usual foam rubber, he cast it out of gelatin. Of course, that made it very fragile and sensitive to light, but it had the quality of skin and gave the kinds of movements you get with flesh. We shot it in reverse. The head was mounted on an armature and we pulled the braces back into the mouth. Then someone out of camera range, with hands like the little boy's, grabbed at the mouth with the braces crawling out. Then we cut to a slightly wider shot."

The slightly wider shot employed actor Oliver Robbins, and was again photographed in reverse. The braces material — a thin plastic line, similar to fishing line, interspersed with mirrored mylar — was pulled down over his face and into a concealed tube attached to his wrist. A subsequent insert of the braces wrapping around Craig T. Nelson's arm was similarly shot in reverse action. "The braces material appears to wrap around the dad's arm when you see it on screen," elaborated Neil. "It seems to have intelligence, wrapping around him like a vine, sucking him into the fray. The shot of the braces snaking towards the light socket was also shot in reverse. We spring-loaded the material so it had a curve to it, like a snake striking.

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Poltergeist, Raiders of the Lost Ark and *Ghostbusters,* ghosts are their stock in trade. The two ghost effects called for in *Poltergeist II* were shot in rather unusual ways, one of which employed a tried-but-failed method considered during the filming of *Ghostbusters.* For the scene where Dan Aykroyd sees a female ghost hovering over his bed, the crew had attempted to shoot the apparition by reflecting an image in mylar. While the technique was ultimately rejected for the earlier film, it seemed a likely enough way to insert the scores of free-form spirits required to emerge from the lawn of the Freeling house. Bill Neil — assisted by Mat Beck — worked with John Bruno to perfect this new type of ghost. Actors, dressed in white leotards with hockey masks and bicycle helmets, were rigged with hoses that allowed dry ice vapor to flow down their bodies. The actors were placed individually and in groups of three in front of a blue screen. Then, through diffusion, Neil shot their reflections in mylar that was being stretched and rippled with a rotating astroturf brush. The film was shot in reverse at high speed and the actors' movements were choreographed in reverse.

While Steve tries to drown his fears in tequila, Henry Kane summons an army of undead disciples for an all-out assault on the Freeling's new home. To create the ghostly images emerging from the front yard, shroud-draped extras were photographed reflected in rippling mylar. Individual groupings were then positioned over a background plate of the house and rephotographed on the Compsy matte stand. / Boss' new animation stand features a motion-controlled pin-block mechanism which allows for the realignment and rephotographing of images directly from 65mm film stock rather than going through opticals or traditional process photography. Heartlights for the emerging ghosts were inserted via this

Normally at Boss, every effects element that will go through the optical department is shot on 65mm stock to preserve the quality of the effect. But based on Beck's tests, it was decided to use 35mm stock because it made the ghost elements look better aesthetically and was more cost-effective. Neil Krepela, who supervised the matte department, blew the 35mm ghosts up to 65mm and rephotographed them on 'Compsy,' Boss Film's motion-controlled matte camera system. "I took the 35mm footage and made a 65mm low-con color print. John Bruno had made a photographic print of the house and drawn where he wanted each of the ghosts to appear, numbering them individually. In fact, he took little photos and glued those on the blow-up of the house. I took the paste-up he did, photographed it in black-and-white on Compsy and projected that back up through the camera. I had this whole roll of 65mm pieces of ghosts. I would then project a ghost on the rear screen and move Compsy around until the projection lined up — both in size and scale — with where it should be in the frame. For example, if a ghost was supposed to appear in the upper left-hand corner of the lawn, I would pan the camera to the right and down so that the little projected area of the ghost would line up on the screen. I pushed a button on Compsy and recorded every position of the camera along every axis. I did that until I had a ghost for each position on the paste-up."

With all the ghosts positioned, Krepela was able to reshoot them in their proper places for the background plate. It became

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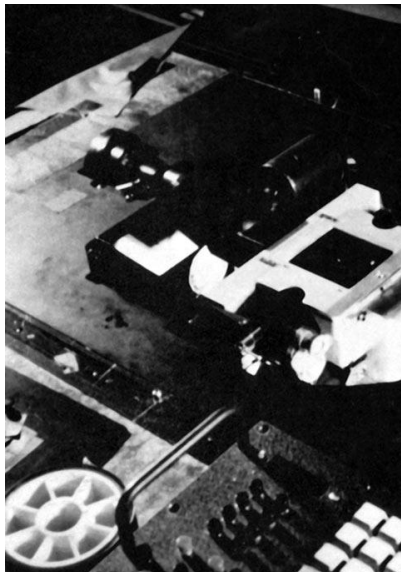

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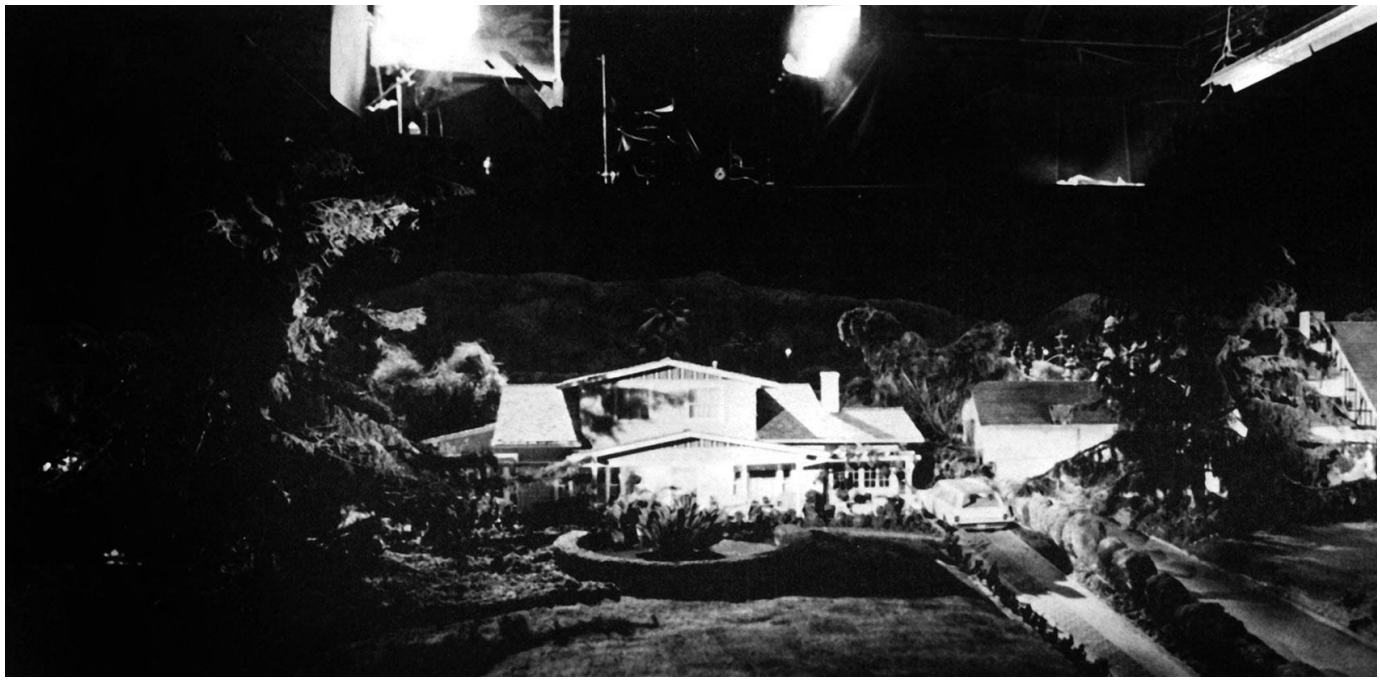

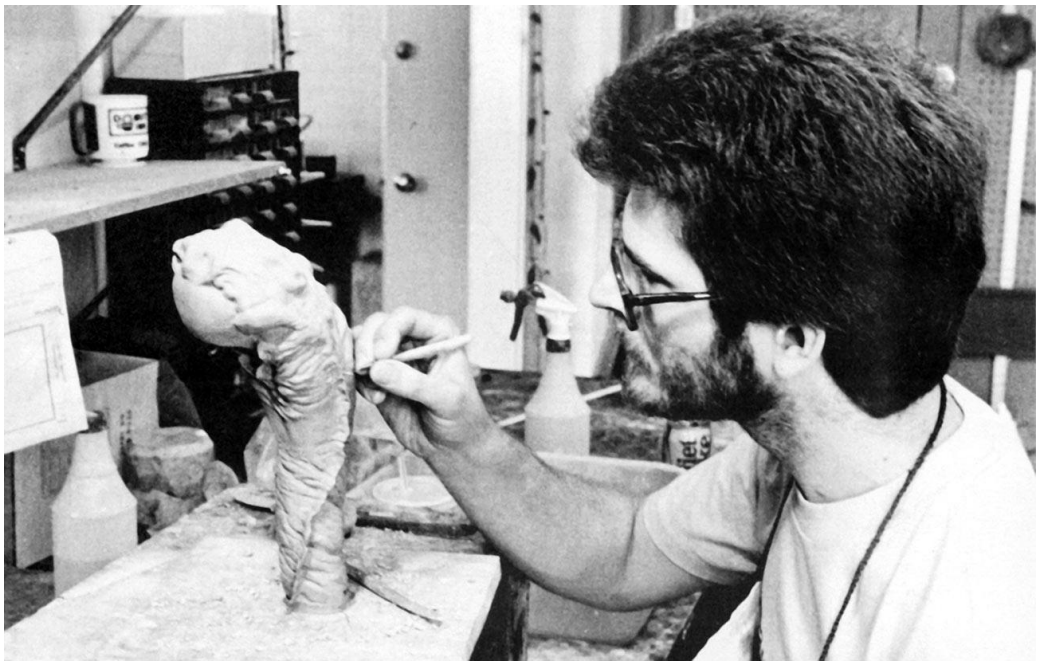

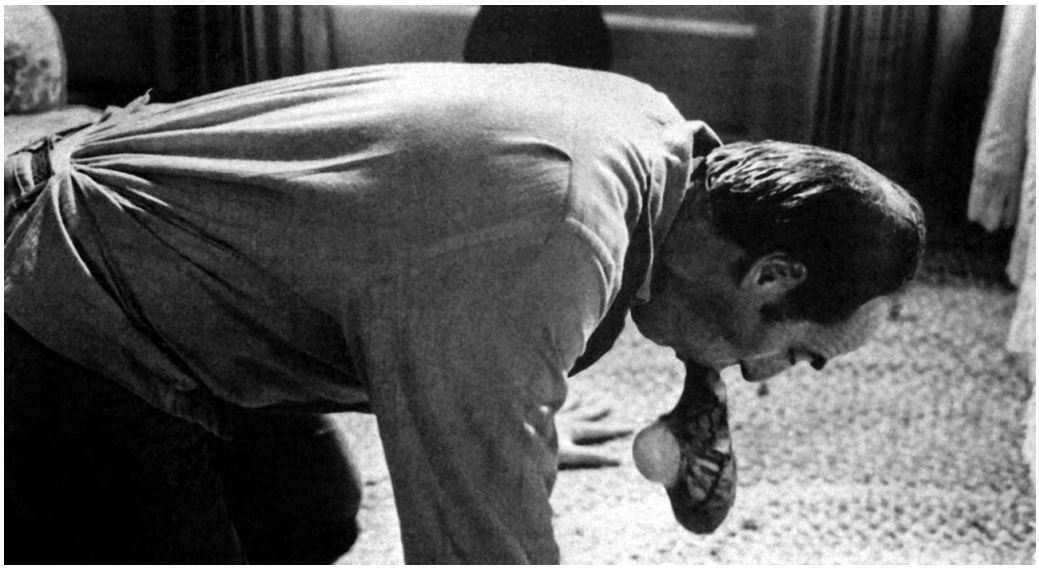

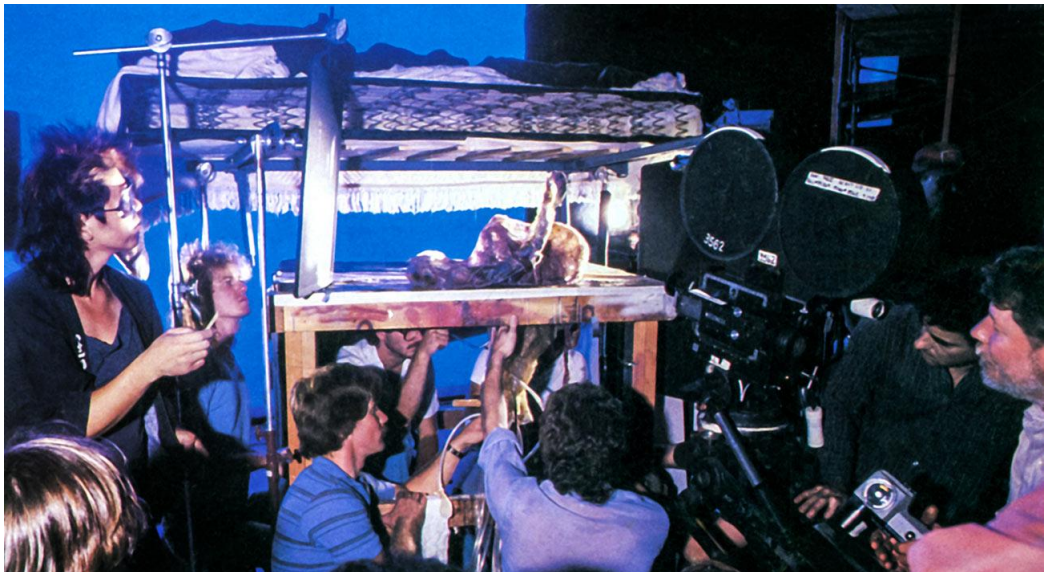

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The 'second stage vomit,' as it was
separately sculpted piece. It too was a ba
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pieces of their special-recipe 'placenta
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of evolution or birth. The 'third stage
same mold as the second stage renditi
illusion of the worm crawling out of St
the bed. To operate the creature during
worm's transition, cables were run throu
the set and attached to a drill motor. Co
crawls under the bed, Steve Freeling
side lamp.

"I love Giger's designs," stated Joh
scary and I think they fit the film. But ev
phase, anyone who saw the designs was
of *Alien.* His stuff just has a really dist
could get around the *Alien* look was no
but to change its execution. Since ev
translucent, every chance we could v
creatures — which is why Steve knocks t
One thing I kept forcing on everybody —
reference, was fetal photography. They
little embryos to get them on film. Som
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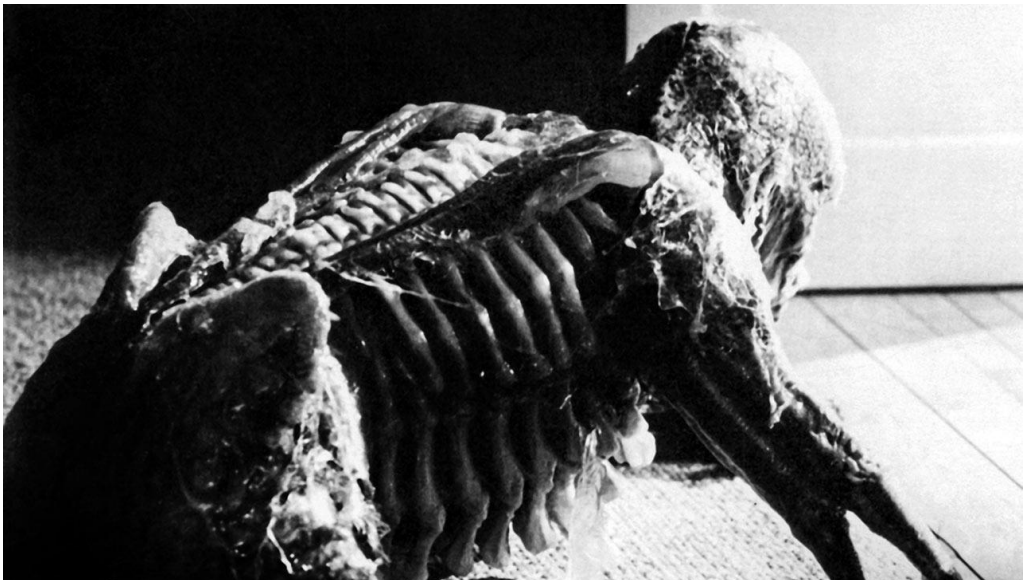

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The primitive creature finally winds up in the hallway where it completes its metamorphosis into the great beast. Although this incarnation of evil also takes on the more orthodox human form of Kane, the bestial version was used in several key scenes throughout *Poltergeist II*. In creating the Giger-designed monster, Connie DeFries worked extensively with Mark Siegel, who sculpted most of the beast and contributed some of his own sculptures to what became its torso. "The beast was made up of all these faces that were supposed to be the souls of Kane's followers," explained Johnson. "Connie sculpted a lot of the heads for the beast. He had a style that was really different from what people in my background have, but it was a perfect representation of what Giger does. It was very amorphous — loose and not finished off or detailed. It was rough emotion thrown into clay."

One of the initial problems to be resolved was just how big to make the creature. "The first time any of us realized what we were dealing with was when Mark Stetson got his miniature of the hallway finished," Johnson admitted. "He built a partial piece of the set for us and we put a small model of the monster into it and I thought: 'How is this going to work? It's just crammed in there.' But the model stuck around for a few days and I started really liking the size. I think it gave the whole sequence a sense of claustrophobia. To begin with, Mark Wilson built a full-scale, twenty-four-foot mockup of cut foam and dowels so that we could see the relationship between the beast and the actors. We knew the beast had to do certain things from the script and storyboards. In the hallway sequence, it gets stuck, so it obviously has to be a tight fit. But it also needed a little bit of room to move around — at least enough to do the action called for in the script." Taking into consideration the limitations of mechanizing it, Johnson and crew ultimately built the great beast at half-scale. The completed monster measured twelve feet tall with a ten-foot arm span.

The monster had to be both versatile and durable as it was needed in over twenty-five shots. "It had six legs, a hundred faces on it and twelve or thirteen tentacles on its head," said Johnson. "In the movie, the creature had a part like an actor — it was not something that was just on and off again. Everywhere that we might normally have taken short cuts — for instance, if it weren't going to be seen from a certain angle, we wouldn't usually finish off that side — we couldn't. Everything had to be adjustable or removable." Operating the elaborate creature, marionetted by as many as twenty-five puppeteers, proved to be an incredible undertaking — and a rotoscoping nightmare.

The multipiece suit, complete with vestigial arms and legs and a mechanized closeup head, was cast in Hot-Melt vinyl to impart the translucent quality of Giger's artwork. / Screaming Mad George, who sculpted most of the figure, works on the primitive creature's tail section. / Noble Craig undergoes the involved suiting-up process prior to photography. / Cameras roll as Craig makes

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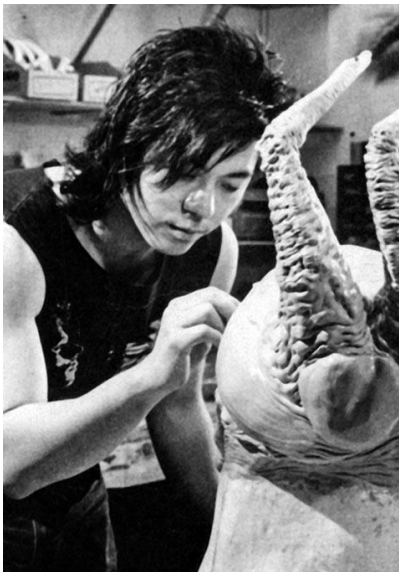

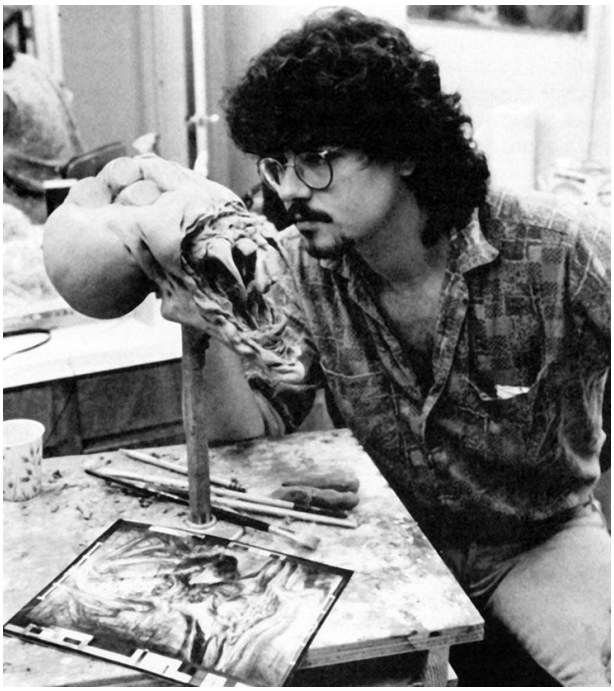

beast I couldn't see very well. So I went to the creature shop, looked at the beast, talked with the creature makers and asked them: 'How do you think you're going to rig these parts of the beast? What kinds of wires do you think you'll be using?' I would then give them suggestions as to what they might do to help us — perhaps saving us more time and work in the long run. I also tried to work closely with the stage crew when they shot the beast to help find ways of making the wires thinner or suggest approaches for figuring out mattes. Because the elbows were so difficult to see, the crew covered them with white cloth so we would later know where to rotoscope. Even at that, there were *still* some frames where we couldn't see the beast's elbow at all — so we rotoscoped in a fake elbow instead."

The hallway confrontation was on everybody's list as one of the film's toughest sequences. Not only did it involve the monster puppet, a hallway miniature and massive applications of rotoscoping, but also live-action plates, a matte painting, animated effects and a pair of large mechanical arms. "Rather than trying motion control on the stage for the shot of the beast rising up in the hall," explained Neil Krepela, "we decided to just shoot reference footage of the hallway and Matthew Yuricich would then do a kind of out-of-focus painting of it. Months later, Bill Neil shot the bluescreen of the monster with a tilt-up. He just cranked it by hand and didn't have to do any motion control. We picked the take that we liked and plotted out the tilt-up using Compsy. We matched Bill's move for every frame that Brian Gibson wanted to use. When we photographed the painting, we used that program and put the two of them together. When the shot was composited, we were right smack together. A hand move has a certain character to it that a mechanical motion control move doesn't have. It suited this beast. At dailies, it just went through. A lot of people didn't realize what the shot was."

For optical supervisor Mark Vargo and crew, comps that go by unnoticed in dailies are the highest of compliments. Every effects shot eventually winds up in his department, and this one was shepherded through by Brad Kuehn and Ed Jones. The bluescreened beast was inserted into the live-action plates and matte paintings via roto mattes, with animated shadows completing the illusion. The mattes allowed sections of the beast to cross over pieces of the set and the shadows tied the monster firmly into the scene.

Acting with monsters that aren't actually there — reacting to evils that will be seen only in a composited print — makes life on an effects film very interesting for the actors. For this

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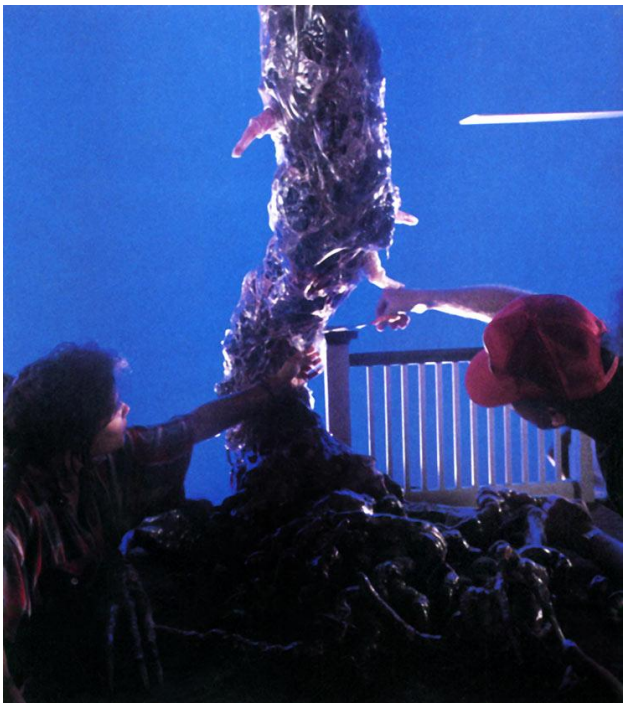

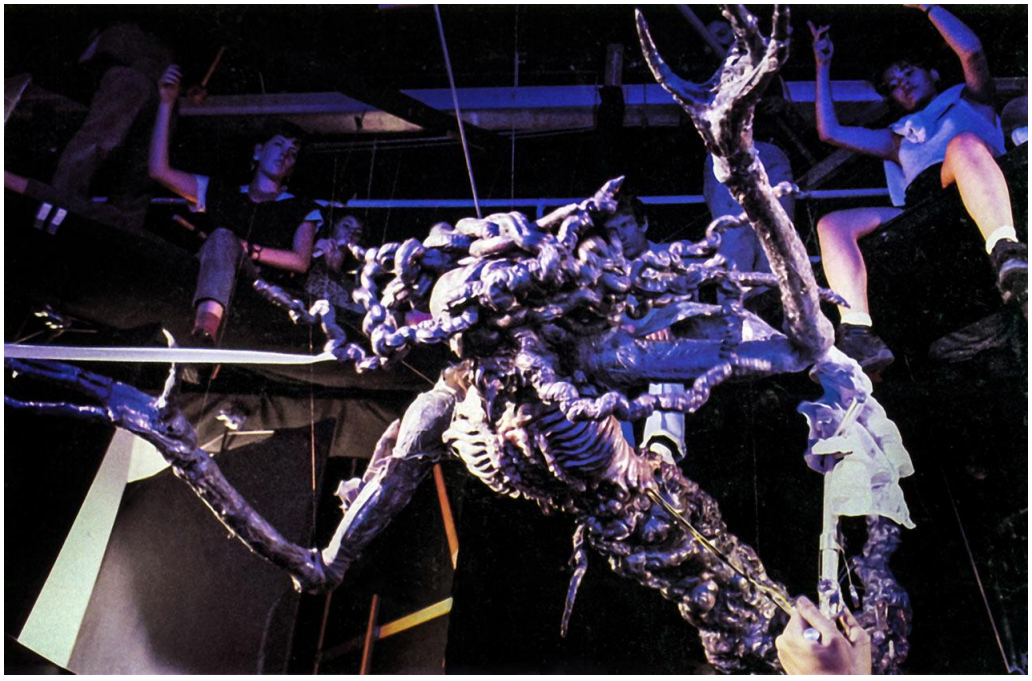

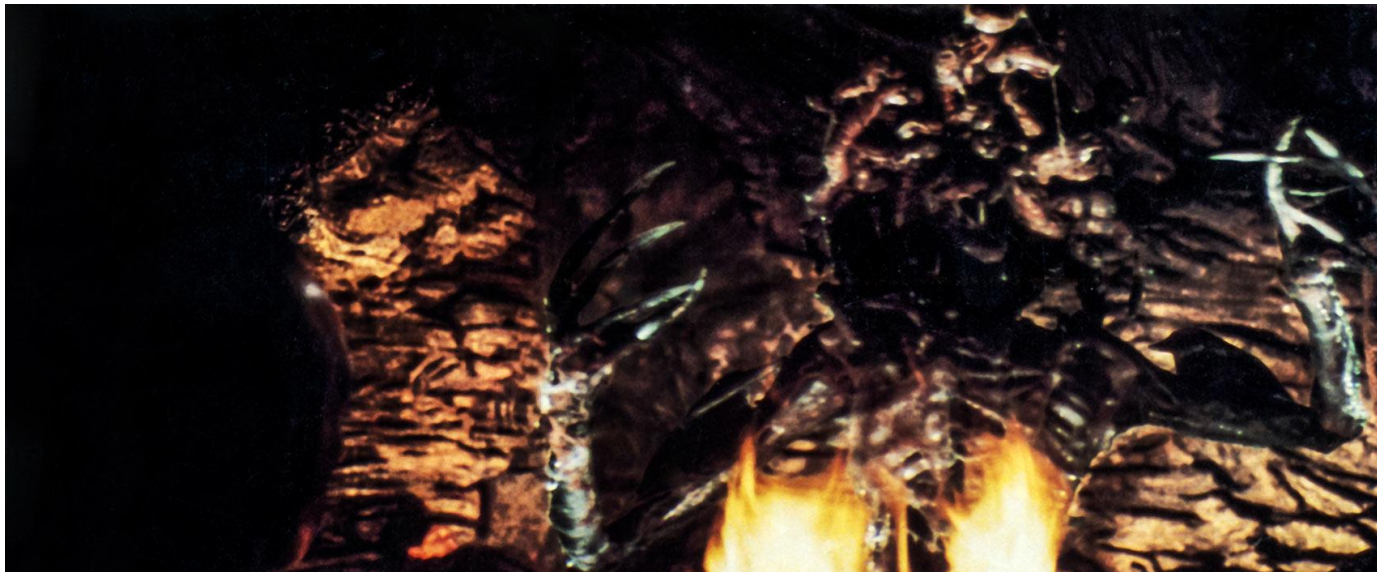

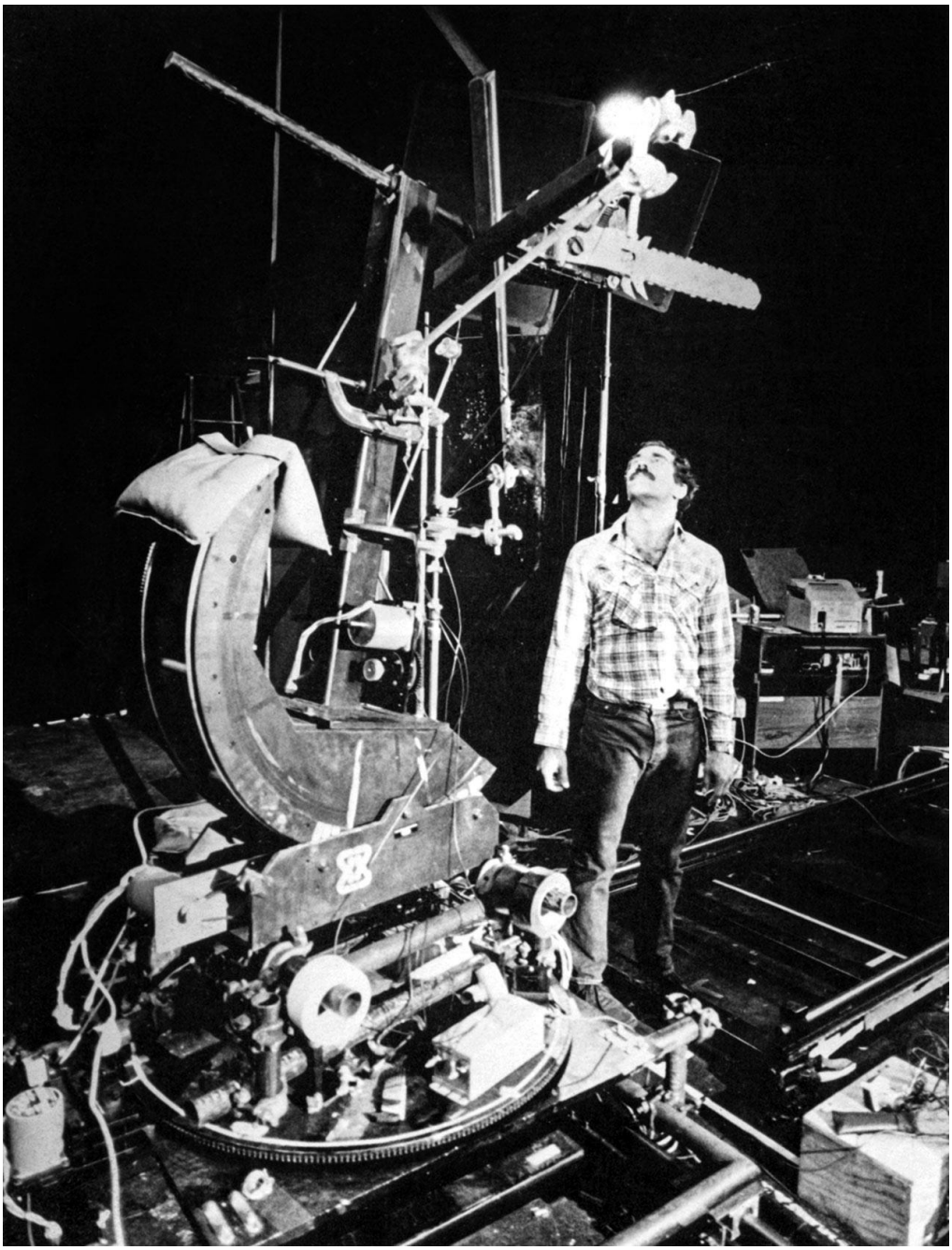

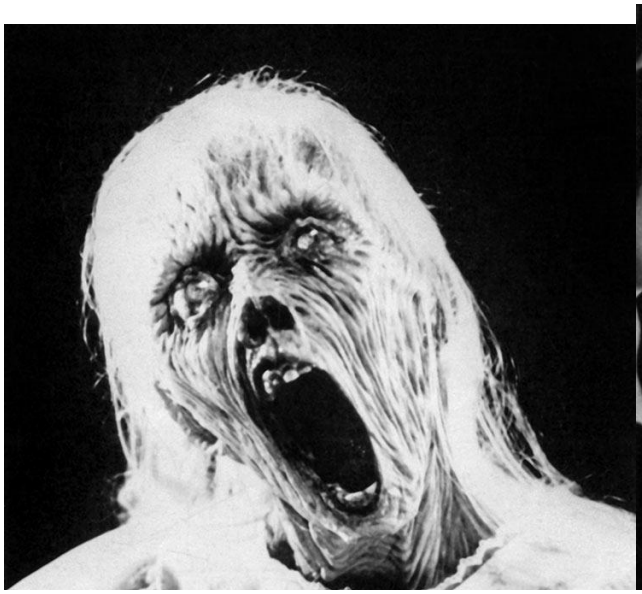

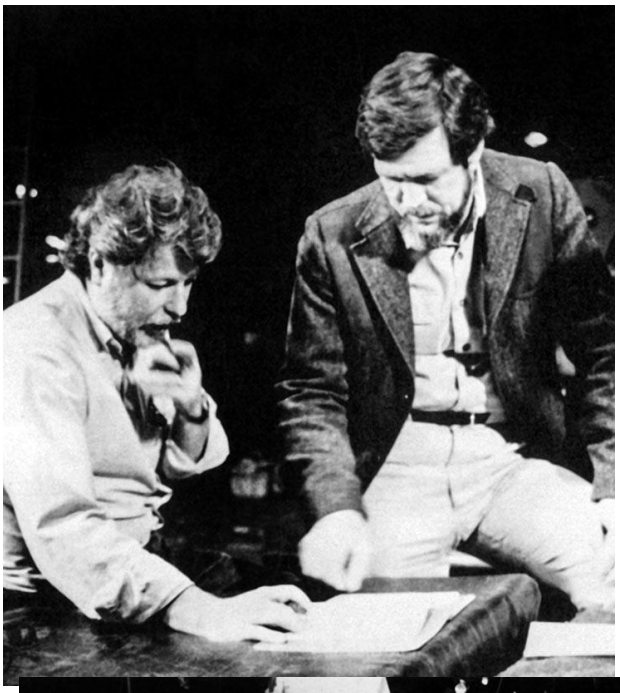

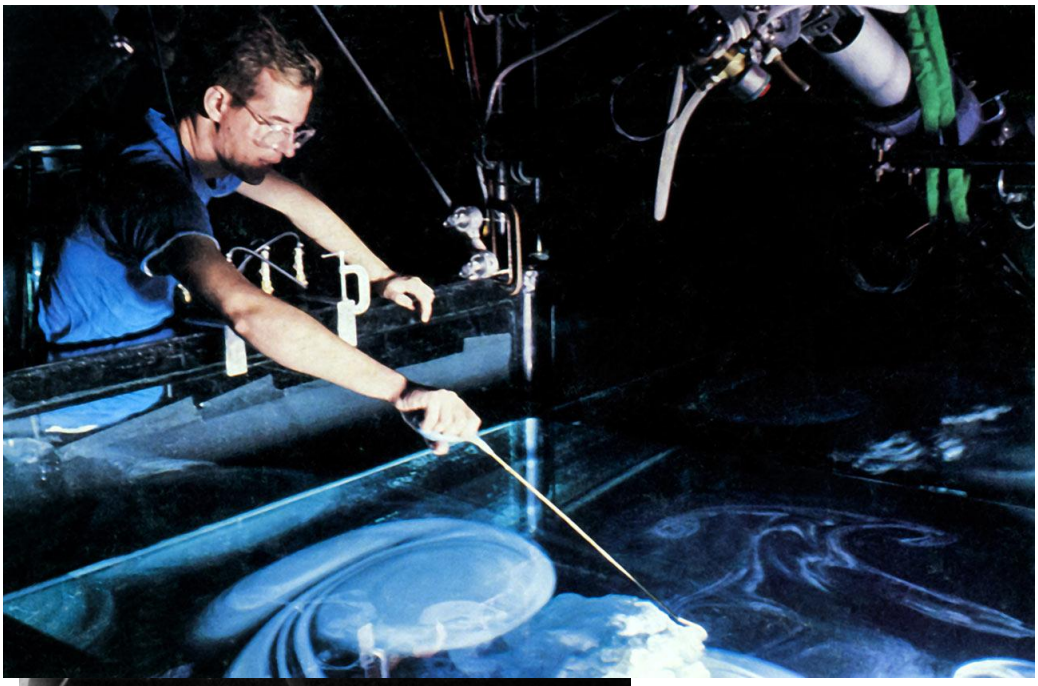

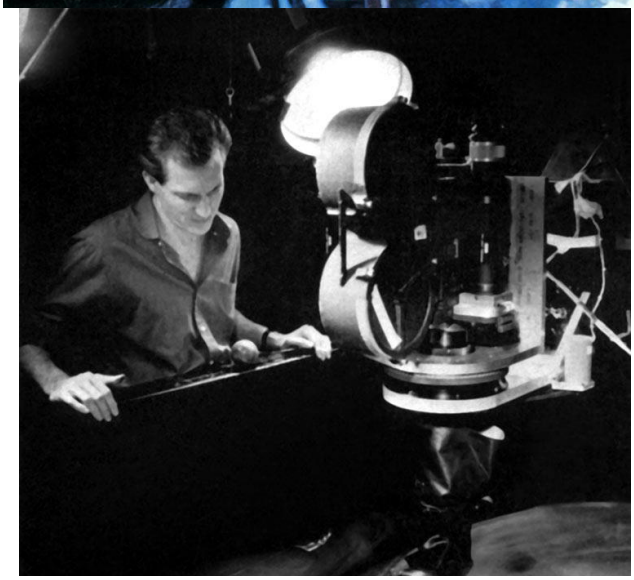

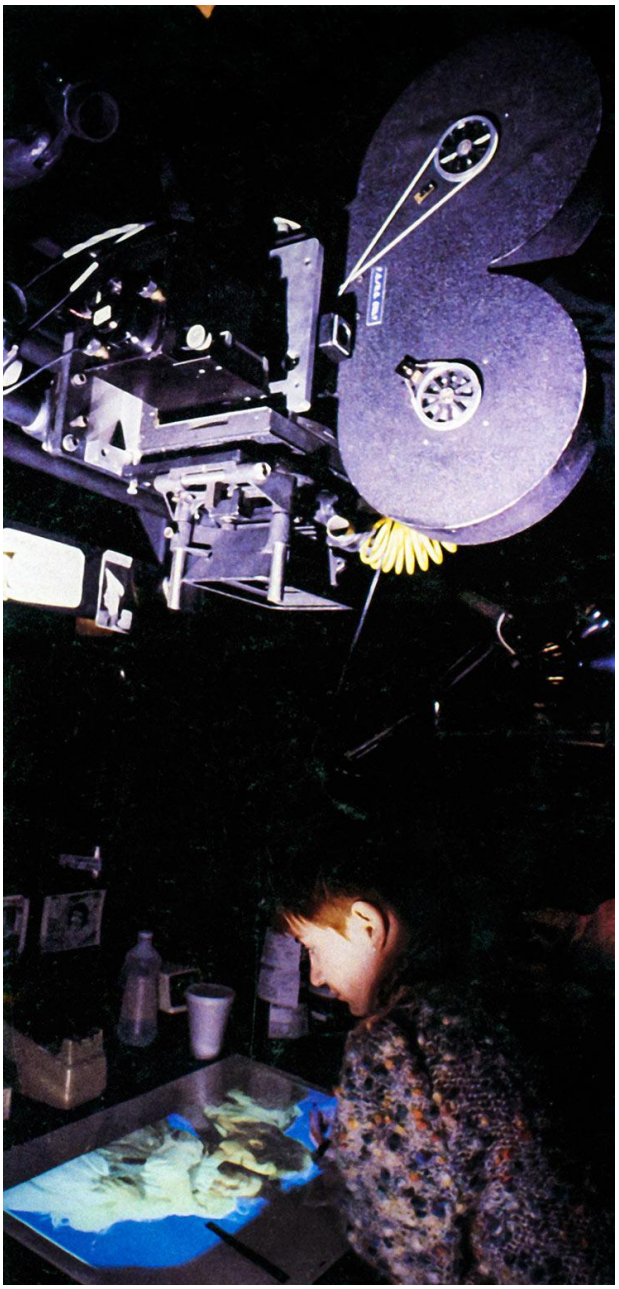

Carol Anne heads were motion-controlled to turn towards camera, her mouth opening in a scream. The shot took several weeks to accomplish. Chris Regan later took all the elements — matching them on the new Zap printer — and did a pull-back with overlapping dissolves built into the separations, thus adding a level of complexity that helped to disguise the standard head replacement technique.

Additional scenes featuring JoBeth Williams were also created. At one point, zombies were included to haunt Diane's closet — as well as Robbie's bathroom — attack her and try to pull her underground. Most of the additional work for that sequence was accomplished in about ten days. In spite of the hectic pace, it was an enjoyable task for the monster makers. Given Steve Johnson's main crew directive to make as many zombies as possible in a week, the sculptors had a tremendous amount of freedom to design their own personal nightmarish undead. At the end of the ten days, there were seven puppets and four actors in zombie makeup. A crew of sculptors, including Johnson, Ken Diaz, David Matherly, Kevin Brennan, Lesa Nielsen and Todd Masters worked long nights and weekends on the project. Each artist had his or her own technique resulting in an array of zombies — baby zombies, fat zombies, skinny zombies, Victorian zombies, tall zombies and ordinary, everyday zombies. Their main contribution to *Poltergeist II* was that of shock value — one of those nasty little moments during a horror picture when the music warns that you are about to jump out of your chair.

The final scene of the film was altered as well. Originally, the climactic slaying of the great beast was achieved via the strength of the Freeling family's love for one another. The producers, however, found this approach too intellectual and vague, and felt some sort of magical weapon was in order. An Indian spear was thus written into the script, with establishing shots edited in early on. The beast is now vanquished in a considerably more exciting scene when Taylor throws the spear into an earthly fire and it breaks through to the astral dimension where Steve Freeling makes good use of it.

Although comparisons are odious, when speaking of sequels they are inevitable. With the exceptions of Steve Johnson and Mark Stetson, nearly all of the principal effects people involved in *Poltergeist II* had worked on the original film. Most maintained that they tried to preserve a certain continuity of look, yet insisted that the two pictures were still very different. The evil is subtler; more is left to the imagination. A shivering horror rather than a screaming one. Some crew members thought it was more difficult to do *Poltergeist II* because they *had* worked on the first one. Others strove mightily not to imitate themselves. Everyone discovered new insights into the political machinations involved in making movies. Borrowing a comment from the original *Poltergeist*'s editor, Michael Kahn,

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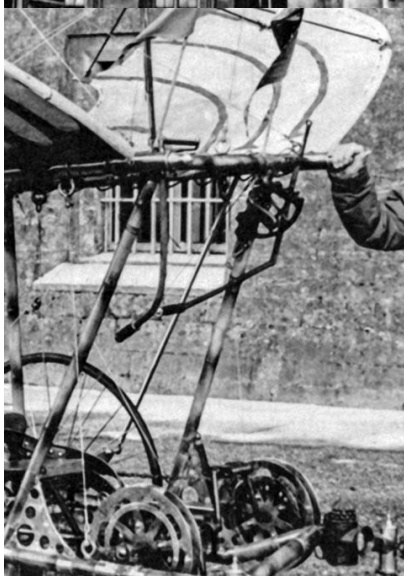
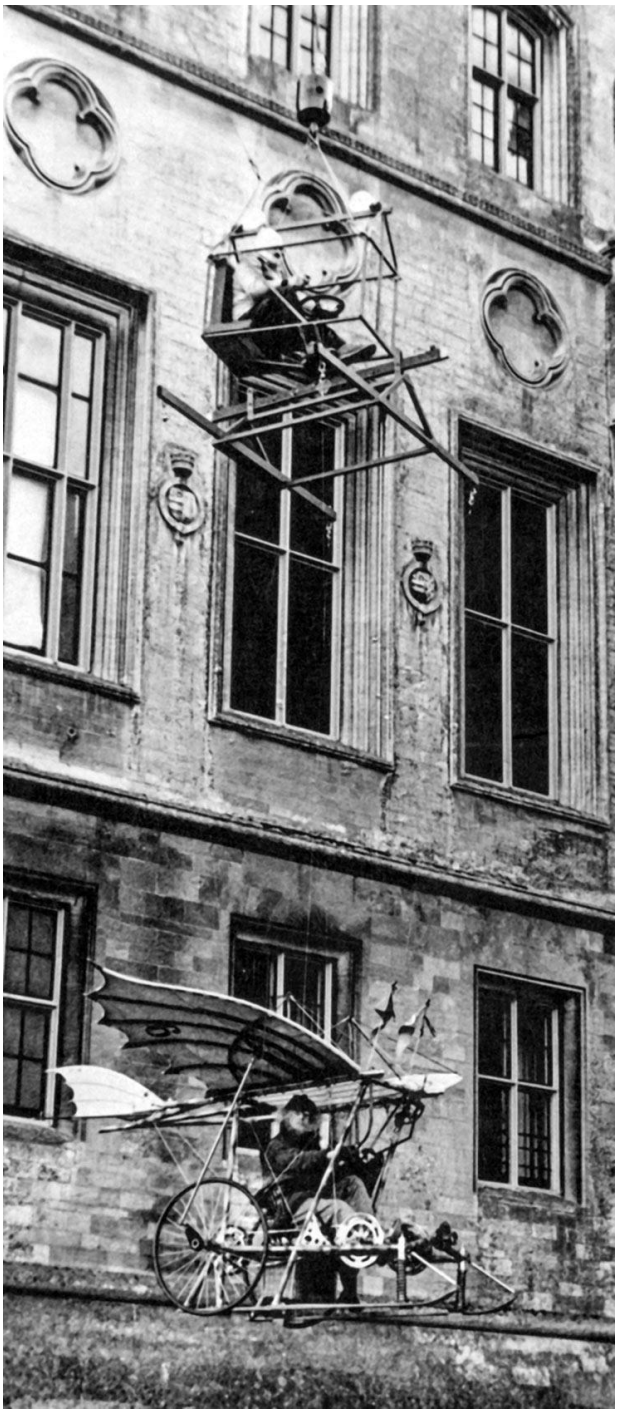
zontal support cable or crane arm, in others a more elaborate overhead rig was employed. "We worked out how wide the shot was going to be and we hung wires from the machine to a controller's cage mounted above on the support cable. A driving wheel in the cage was attached to a rig underneath that enabled the operator to move the machine left and right and dip it down slightly. This was necessary because the machine — which had a twenty-five foot wingspan on it — tended to want to do its own thing and stray from the wires, especially when a breeze came up, so it had to be corrected all the time and kept on course. Generally, there was about ten or twelve feet of wire between the controller and the flying machine. Obviously, the shorter you can keep the wires on something like that, the better. You don't want a lot of room for 'play' in there, especially when the wind comes up. There were times when we just couldn't take it up because it would have been too dangerous. We used heavy piano wire and though the wires had to be kept to a minimum so the camera wouldn't read them, we played it safe. An effects man told me a long time ago, 'If you're flying a mouse, calculate for an elephant.' I always keep that in the back of my mind."

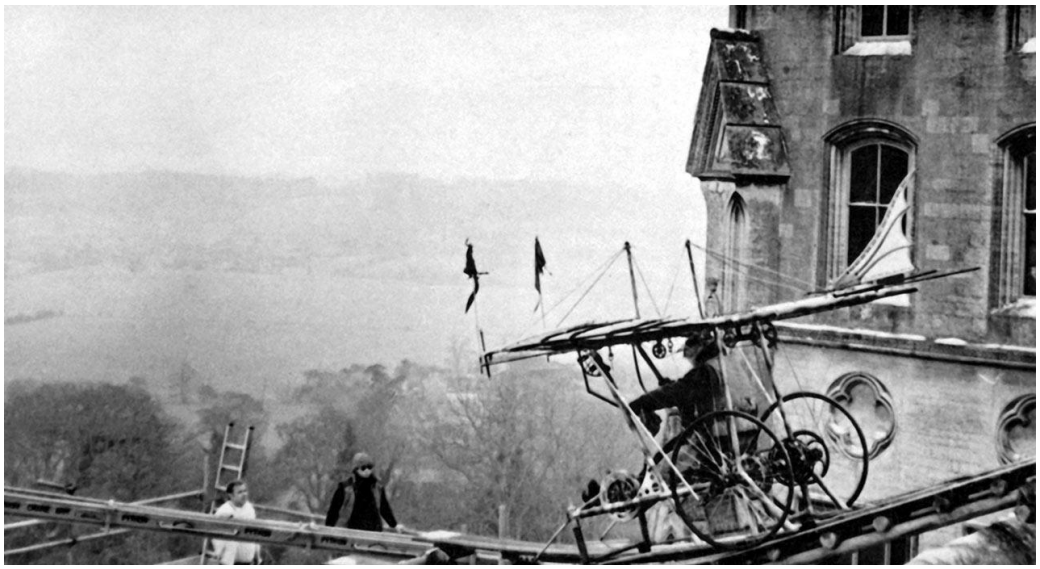
The effects team became quite proficient at flying the machine and included some impressive flips and rolls which were, unfortunately, cut from the film. One deleted shot in particular was a disappointment for West. "One of the takes we got of the flying machine at night was when the two boys get into it and take off from the roof. Just as they were flying across the courtyard, a cloud moved away from the moon — if it wasn't the famous *E.T.* shot, I don't know what it was. From where I was, right behind the camera, that flying machine went straight across the moon. It was unbelievable, and they didn't use it. It was *so* unbelievable, people probably would have thought that it was a model." Though stunt doubles were used for most of the flying scenes, the actors themselves were sometimes in the driver's seat. "An early flying sequence in which Waxflatter crashes after an unsuccessful flight was actually done by Nigel Stock who played the professor. He loved doing it."

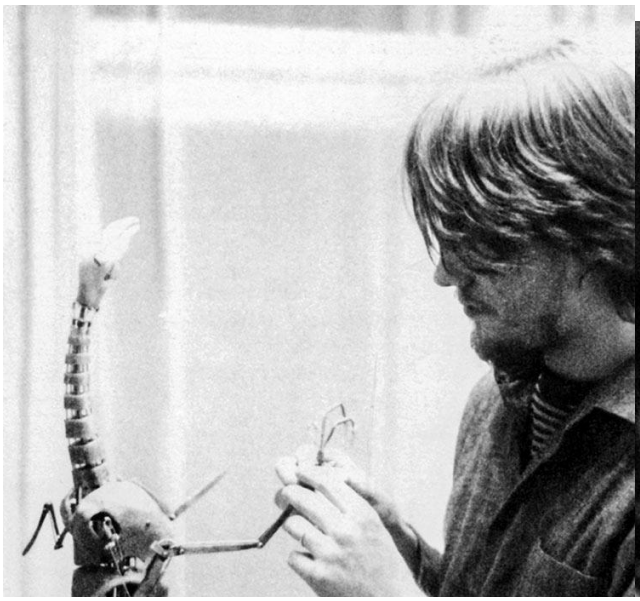
The flying machine and the snow effects were both vital elements of the film, yet the bulk of the effects work would be evidenced in the hallucination sequences. Executed solely through physical effects techniques, the first of these sequences reveals the horrifying extent of the case in which Holmes and his associates eventually become involved. The victim — a wealthy accountant named Bentley Bobster — is shot with the poisonous dart while dining in a restaurant and in the resulting hallucination imagines his pheasant dinner comes to life and attacks him. Once this wave of terror subsides, he hurries to the safety of his home. He finds no sanctuary from the drug's effects there, however. Indeed, the whole house seems to turn against him as he is 'attacked' first by his front doorknob, then his

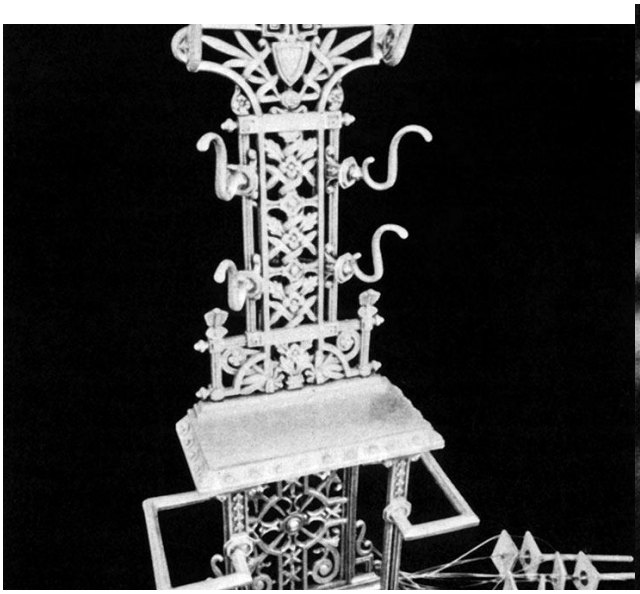


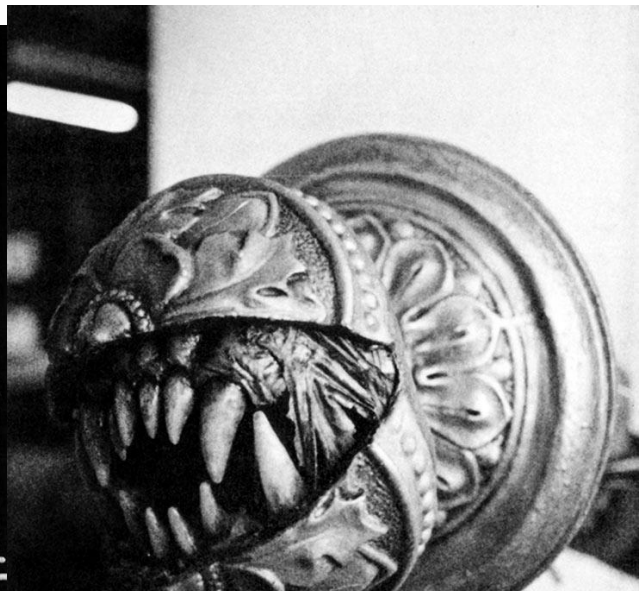
Young Sherlock Holmes — *directed by Barry Levinson for Amblin Entertainment — has as one of its centerpieces a primitive flying machine conceived and constructed by Holmes' dear friend and mentor, the eccentric Professor Waxflatter. / Designed by the film's art department and constructed by a small aviation firm, the flying machine was rendered airworthy through the efforts of physical effects supervisor Kit West. / No miniatures or opticals were used for the flying scenes. Two giant tower cranes were erected and a cable stretched between them. From the main parallel a second cable extended down to a control cage manned by wire-rig expert Robert Harman. A steering wheel mechanism in the cage allowed Harman to impart necessary movements to the machine itself which was suspended on four smaller wires below him. / On location at Belvoir Castle, the effects unit prepares for one of the flying scenes. / A*











and more of a feeling of force. We worke
up with the right face for him — it had to
silly. So we designed the stained glass
over again."

The decision had been made to use th
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cause *Young Sherlock Holmes* was a per
to get in and use it. It was also a great o
get accustomed to film production — s
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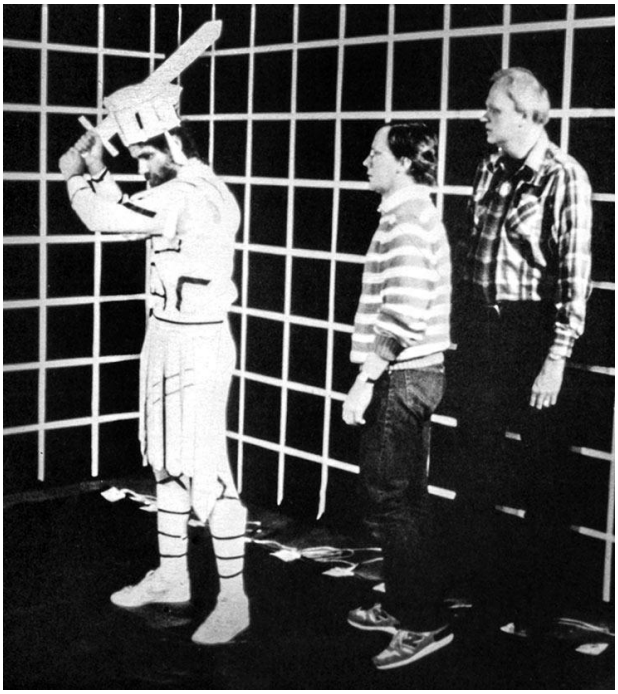
Once the challenge was accepted, the
long and arduous task of producing t
fully-animated character. "We think of t
ing computer imagery as being divide
plained technical supervisor Bill Reeve
three-dimensional model of your figu
stained glass man; second is the anima
actually make it move; third is the rend
final pictures of it that you treat with ligh
is putting it on film."

The initial modeling of the character fe
John Lasseter, who conducted research t
for the stained glass knight. "We were
making the character look organic —
stained glass window that had actually p
life. We went through two or three differe



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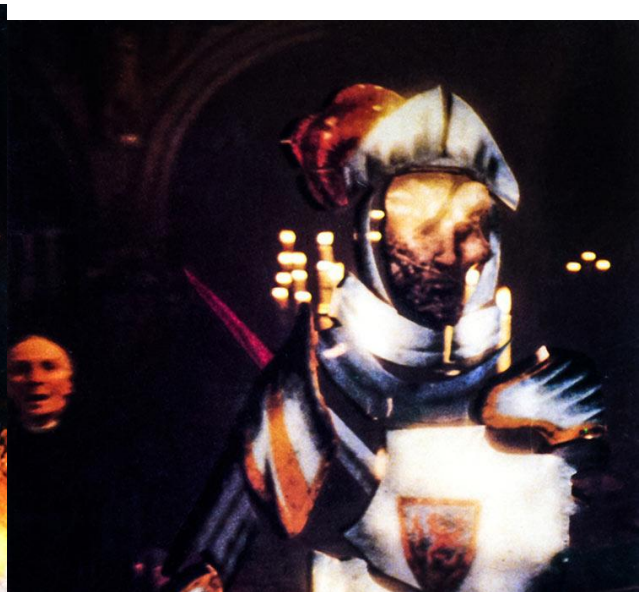


In vector form on an Evans and Sutherland monitor, the stained glass man stands ready to leap from its window. By employing one or more of the hierarchical commands delineated on the accompanying menu, Lasseter was able to choreograph each move. / Still in vector form, the stained glass knight jumps to the floor. For the animator, it was necessary only to position the figure at key frames. From there, the computer could generate the in-between frames in a matter of moments. / Laser technician Don Conway examines the sophisticated laser scanner developed by David DiFrancesco as both an input and an output device. / Lasseter works on a polished rendering of the stained glass man's chest section. A versatile electronic paint system and a complex mix of overlapping texture maps were employed to give color and substance to the figure. / Lasseter and systems programmer David

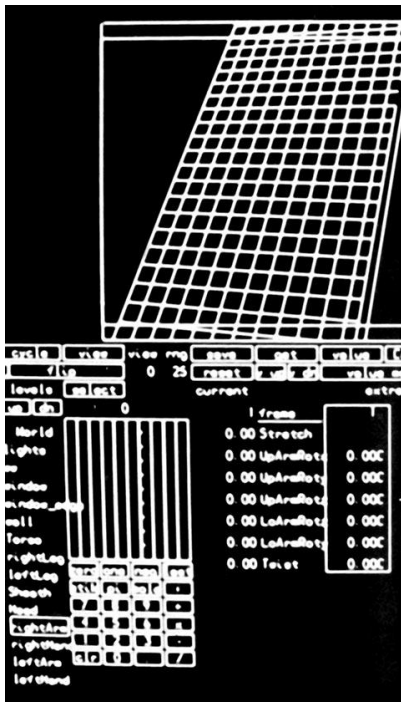
stained glass man was an actual figure, filmed on location in the church. "When I was in England measuring the church," John Lasseter recalled, "I also took notes on the placement of every single light — what angle it was shooting at, what color temperature it was and how bright it was. So when we started adding highlights on the computer, we placed the computer light sources where the actual light sources were on location. Unfortunately, that didn't give us the glints where we wanted them. In the end, Dennis just sat down with us and pointed out exactly where he wanted the highlights to be. It was another case of reality not being right."

"The quality of the work had to match Stephen Goldblatt's photography in the film," Muren insisted, "which meant it had to look as though the stained glass man was lit with the same care and precision as the church. The frustrating thing for me was that I found it almost impossible to light something I couldn't see. There was nothing to grab, to move, to look at and evaluate. It was a real nightmare at first. The analogy we use around here is that lighting computer graphics is like being in a room with a subject in front of you, the lights all set up and the camera ready to go — but you have no arms or legs."

The computer team was able to give Muren 'arms and legs' by building a significant addition to the system — a software mechanism which enabled them to position computer light sources wherever they chose and perceive, in vector form, where the highlights would fall. "With the old system," Reeves noted, "we could put in a light and point it in a direction, but we couldn't guarantee that it would give you a glint off a given surface. You need mathematics to tell you that, and the whole rendering program, which takes a lot of time. So Eben Ostby and David Salesin went in and removed that little piece of code from the rendering system, put it in the vector system, and as a result provided visual cues in a matter of seconds rather than hours."

"It was sort of a backwards approach," Lasseter elaborated. "Normally you would take a light, point it at a piece of glass, for instance, and wiggle it around until you got the glint where you wanted it. We reversed that and said, 'Okay, we want a glint right here.' Basically, our piece of glass was divided up into a grid and all the little sections of the grid were numbered. So if we wanted a glint on number 68, for example, the system would figure out where to stick the light to give you that — it would backtrace from the lens. We did this on the Evans and Sutherland vector system, and it turned out to be an easy technique for lighting complex computer graphics."

Once lighting matters were resolved, the credibility of the



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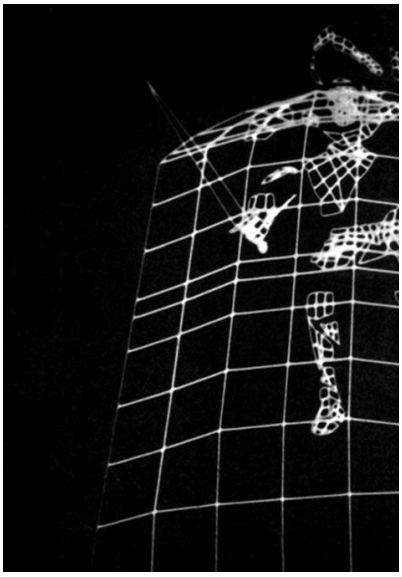

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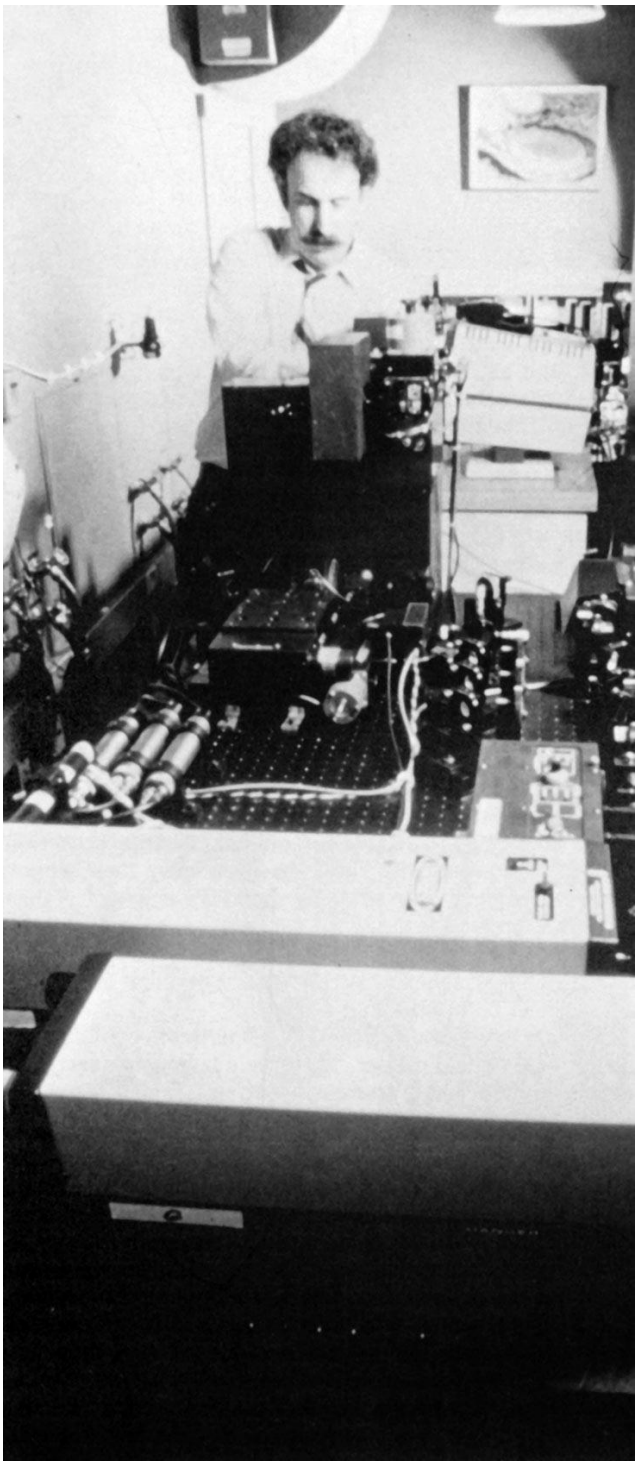

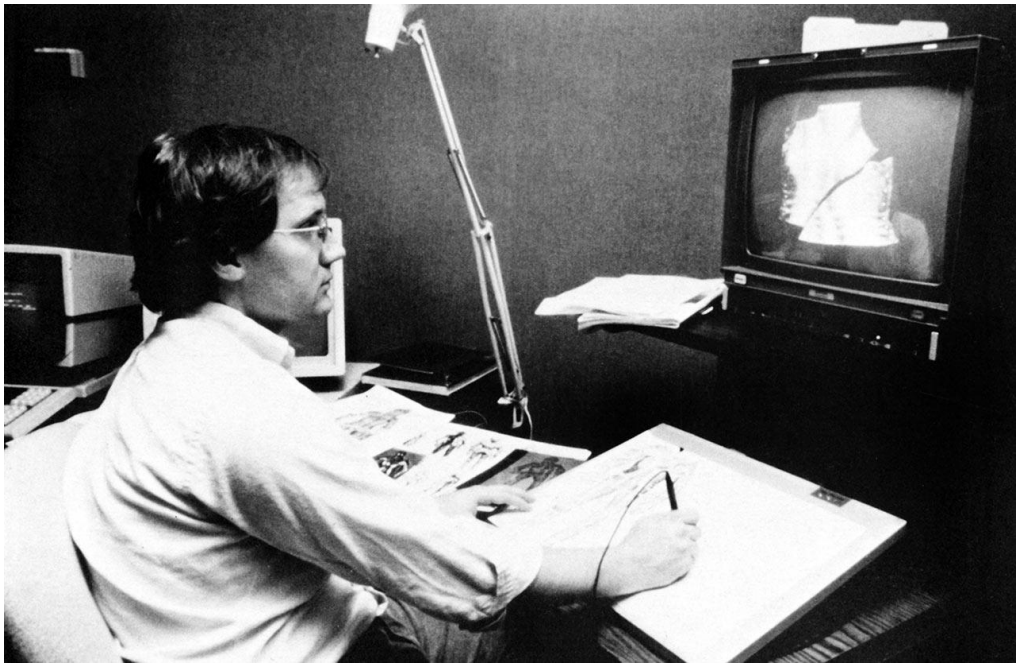

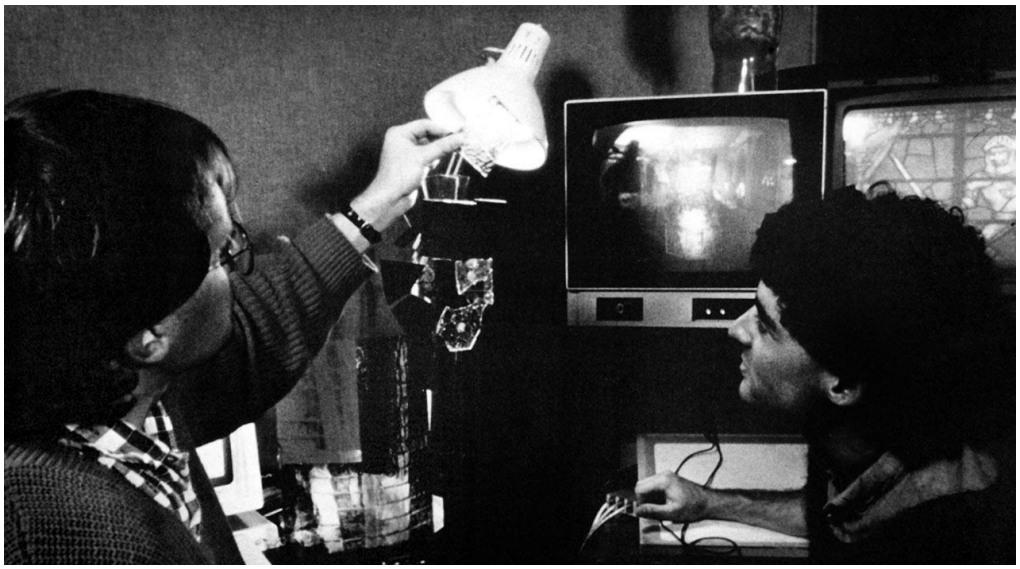

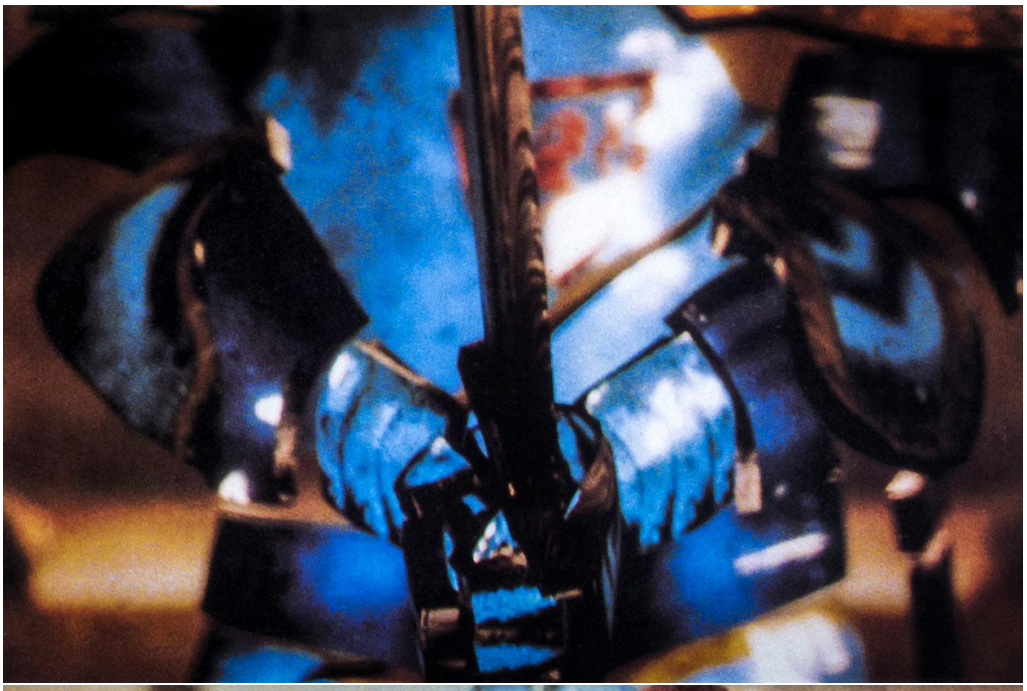

developed for the purpose of getting re
blur. Now there's a program for compu
you that same blur. It just looks wrong

Pixar's laser scanner, developed by D
the essential tool in putting the stained
film and a major step forward in the field
"When we first arrived here," recalled D
enormous log of information and backg
an output medium, and we decided right
were not satisfied with it. CRTs have an
their tubes — sort of on the blue side o
that in order to expose a piece of film a
color that film is capable of, we'd have t
Lasers were an obvious choice. We we
problem of resolution. What is the resolu
video look like film? So there were a lot
issues staring us in the face when we sta
I'm happy to say, most of those have now
scanner that is flexible enough to mak
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color problem has been largely alleviat
have determined which lasers and wh
match up with the most commonly used
rials, namely 5247 and 5243 film. With
of color that matches film almost exa
deficiencies in the yellows, but that's al
And we now have a printer that wor
compatible with most optical printer
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the film and that created difficulties b
output device is hard enough without co
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one or two commercially available digit
run at the resolutions or speeds ours ru
all of the problems have been solved, the
for being able to make motion pictures o
laser scanner both reading and writing."

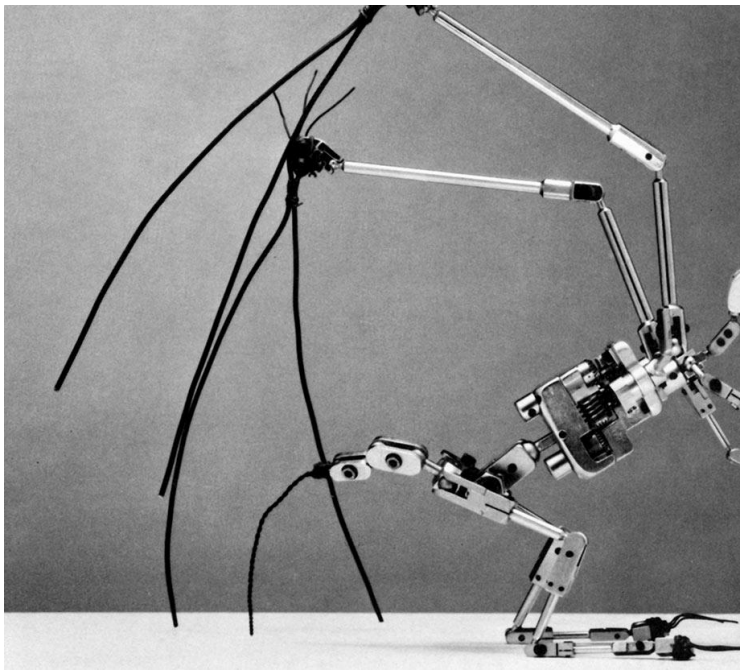
The Pixar laser scanner has many prop
a traditional optical printer. "We have a
scanner section and a transport sectio
"and we work with RGB color separation
optical printer except that our light is
filters, but into discrete, coherent light
laser. Each channel has its own laser —
and is modulated acoustically, which al
pixel at a time. All those pixels, in turn, a
Each pixel in the image has three num
intensity of the three laser beams. The
device called a frame buffer, which is o

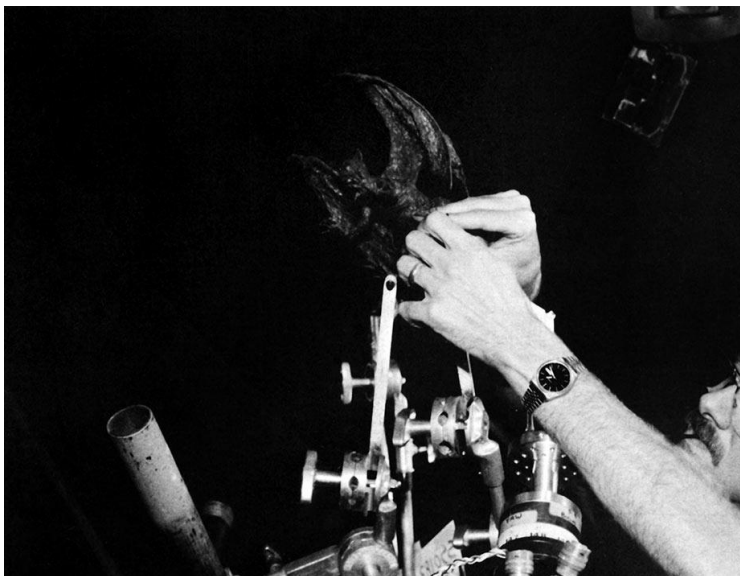
blur from the top to the bottom. So it was absolutely crucial that the blur be there. Without it, there would have been terrible strobing. From that reference material we determined how the wings should move and how much they should blur."

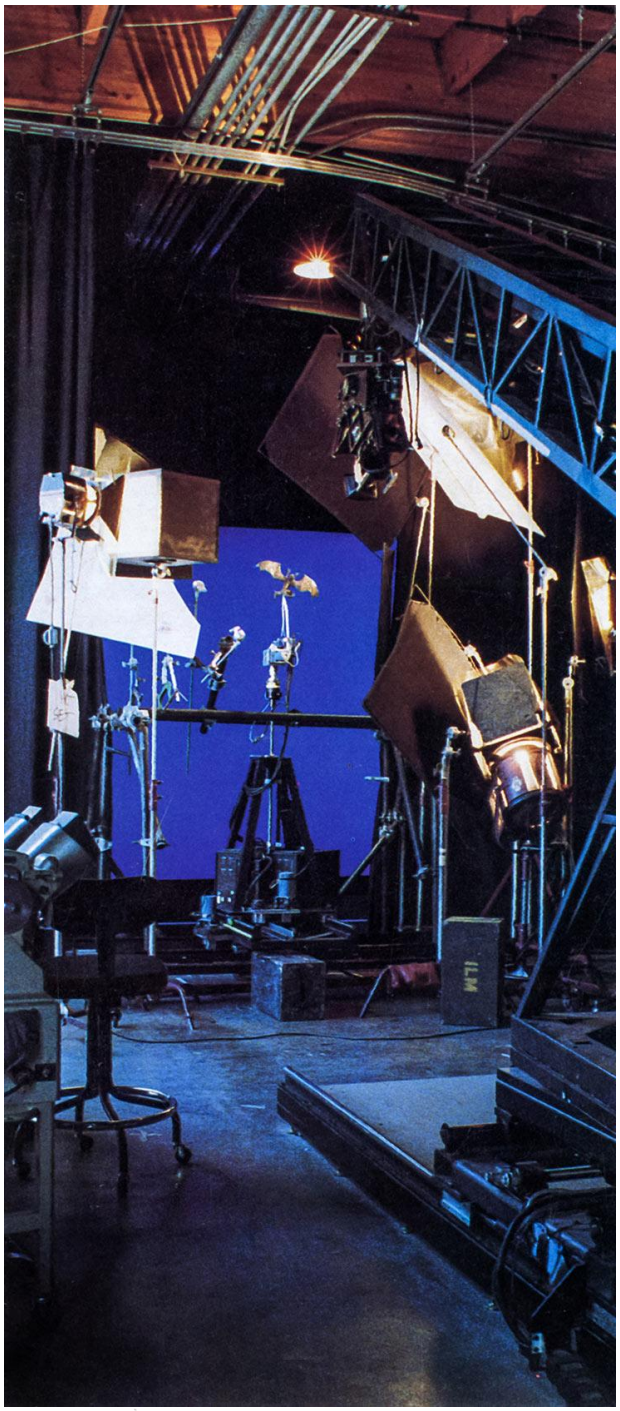
One of the most challenging aspects of the sequence was that not only did the harpies have to have a realistic blur in the movement of their wings, they also had to interact very closely with actor Nigel Stock, landing on his arms and crawling all over him. The first step in the go-motion process was to line up the action of a harpy puppet to the live-action and then program those basic moves into the go-motion computer so that they could be repeated exactly when it came time to film. "Nothing like it had really been done before," commented Walton, "taking a little creature that was attached to someone's hand and flailing it around. In using go-motion for the sequence, Dennis really made the right decision — which Dennis usually does. The computer was just perfect for this application because, even though it could have been done other ways, it would have been much harder. The puppet could have been animated on wires, for example, in front of a rear projection screen and swung or pulled to get blurs, but we wouldn't have gotten the accuracy that we needed. A lot of the time, the harpy was attached to an arm which wasn't just moving side to side, parallel to the screen — it was also rotating back and forth at the same time. So there were three or four compound moves going on and, with a puppet on wires, you just wouldn't be able to get the blur in all those directions. It was difficult enough to program it on the computer."

To determine the gross movement, the eight-inch-tall harpy — sculpted by David Sosalla and armatured by Tom St. Amand — was placed before a front-projection screen upon which was run the live-action footage of Waxflatter flailing his arms about. "The harpy was hooked up to a model mover," Walton explained, "and Mike Owens proceeded frame by frame, advancing the film and then moving the puppet in space to its proper position in relation to the actor in the live-action. Once the move was recorded, we shot some black-and-white test footage and bipacked it on the Moviola with the live-action just to see if we were on the right track." Continuous movement of both puppet and live-action performers was crucial to sustaining the impression that the two were in close interaction. "I was with Barry Levinson over in England when they were shooting the live-action part of the sequence with the actor," Muren recalled, "and I made sure that he was moving all the time. We gave him a lot of action so that he wouldn't be holding still for too long. That way, even if we weren't able to line the harpy up to him *exactly,* you wouldn't really be able to tell."

With the puppet's basic movement programmed into the go-motion computer, the next step was to create the crucial







gave us the blur we needed to make the movements look realistic." The crew was now ready to shoot the harpy puppet in front of a blue screen. Effects cameraman Mike Owens and assistant Pat McArdle carefully lit the puppet to match the intensity and quality of the lighting in the live-action. "Mike shot it using the Vistacruiser camera," Walton explained, "and we were dealing with exposure times of from four to eight seconds. The Vistacruiser enabled us to get more blur or less blur, depending on what we wanted for a scene. In live-action photography, to increase blur you increase the shutter opening and to decrease blur you decrease the shutter opening. Providing that the object is moving at the same rate of speed in both instances, the object will have more or less blur. However, for frame-by-frame 'go-motion' with ILM's computers, this process works differently. Instead of a rotating shutter, the Vistacruiser camera has a capping shutter. The shutter is open for a period of time — say four seconds per frame — and the object moves during exposure at a certain rate of speed. To increase the blur, the computer moves the object at a faster rate of speed during the same four-second exposure, but the object still traverses the same distance per frame. Hence the 'speed' is the same, but there is more blur on the object."

Though the broad movements of the harpy were controlled by the computer, the finer movements of its head and limbs required traditional stop-motion and the hands-on expertise of Harry Walton. "Once we got the basic movement worked out, I'd go in there and animate all the limbs — all those things that the computer wasn't dealing with. The computerized model mover was only moving the harpy's mass. It was mounted into the puppet at either its sides, back or belly — depending on the scene — and its only function was to give it a position and blur. It wasn't really animating or even putting it in its final exact position. All of that was left to me. So the rest of the joints had to be animated, then extended out — the fingers and the wires in the wing membrane, the legs and the arms and the head — all had to be moved frame by frame as well." For Walton, working with go-motion was a mixed blessing. "The system was somewhat difficult for me at first because I'm accustomed to doing stop-motion where you just go in there and move the puppet wherever you want it to go. You have absolute control over it. But with go-motion, the puppet is hooked up to a machine and you have to translate where you want it to go and make the machine move it there. You're sending information to a computer to put the puppet where you want it, and it doesn't always quite go there — and you just want to go in and do it yourself, manually. Fortunately, Mike Owens was very good at working with it, and eventually there was a meeting of the minds between me and the computer."

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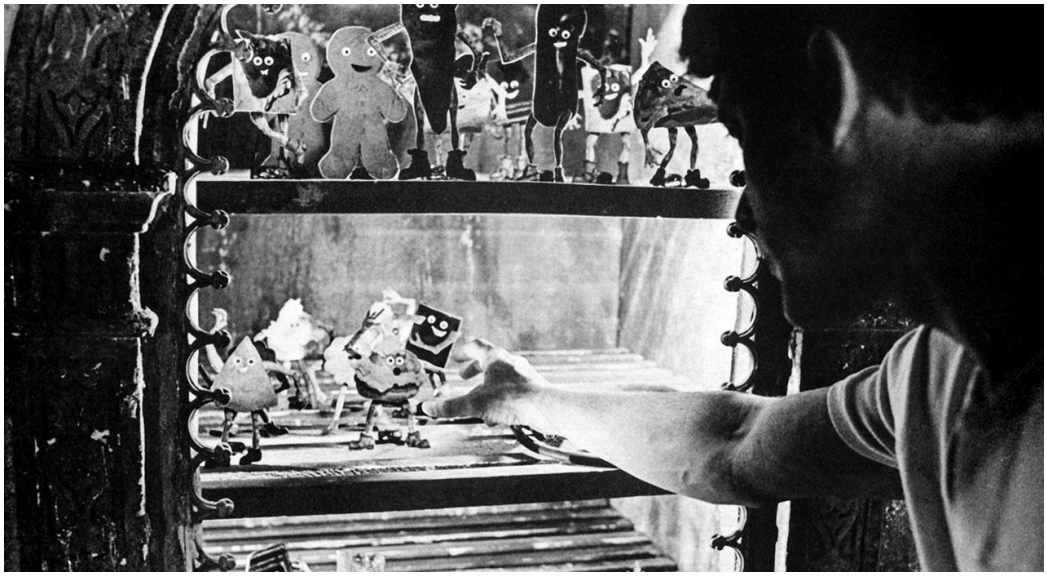
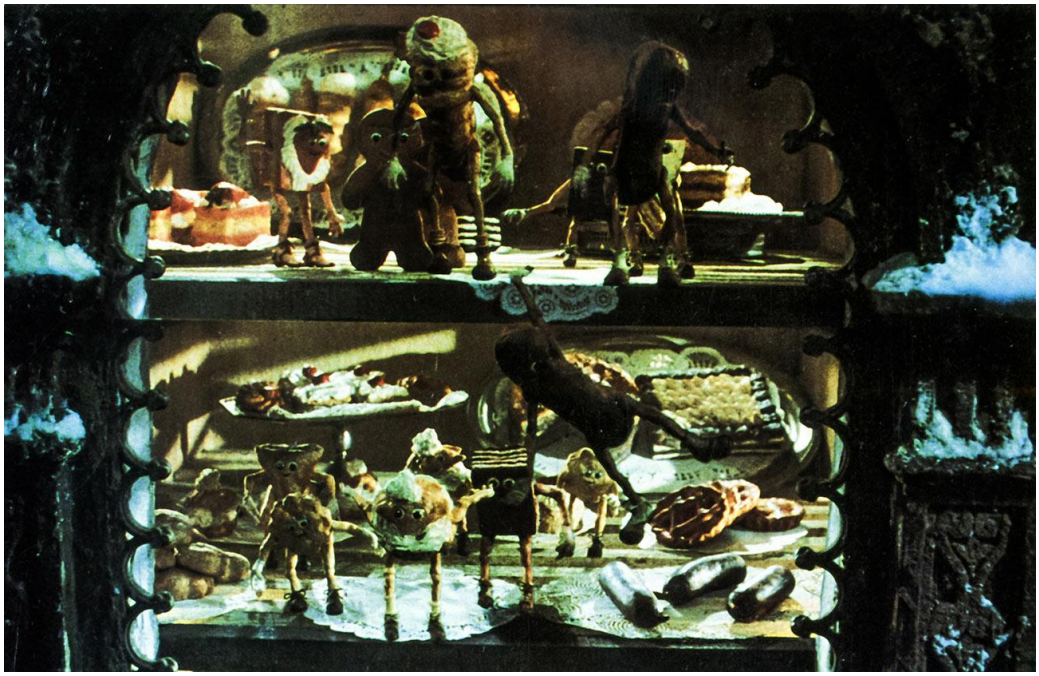
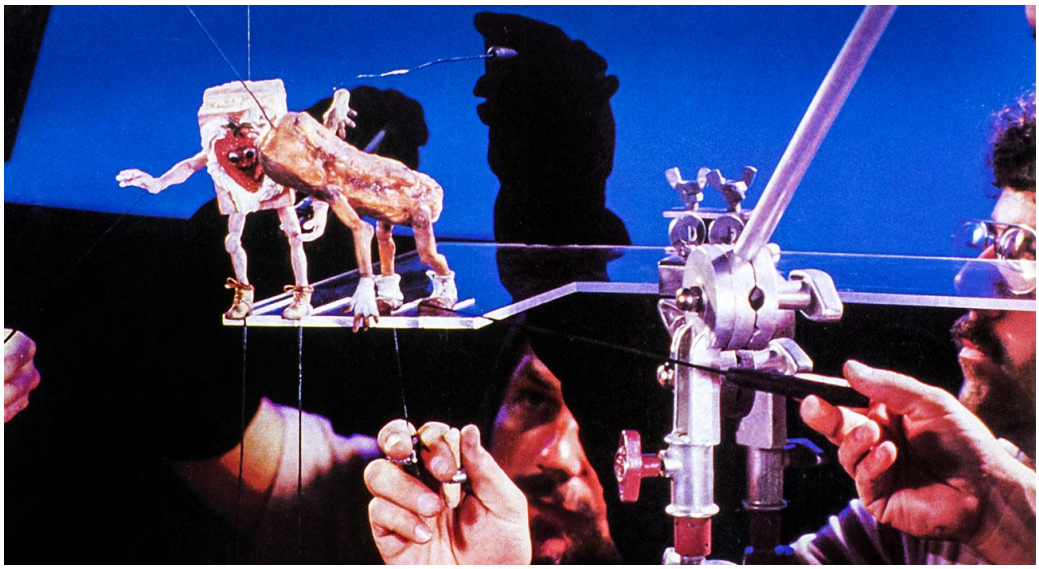
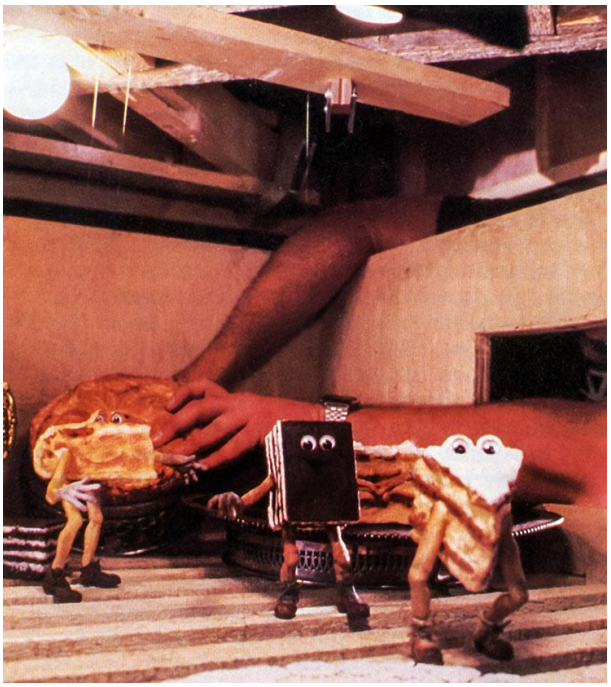








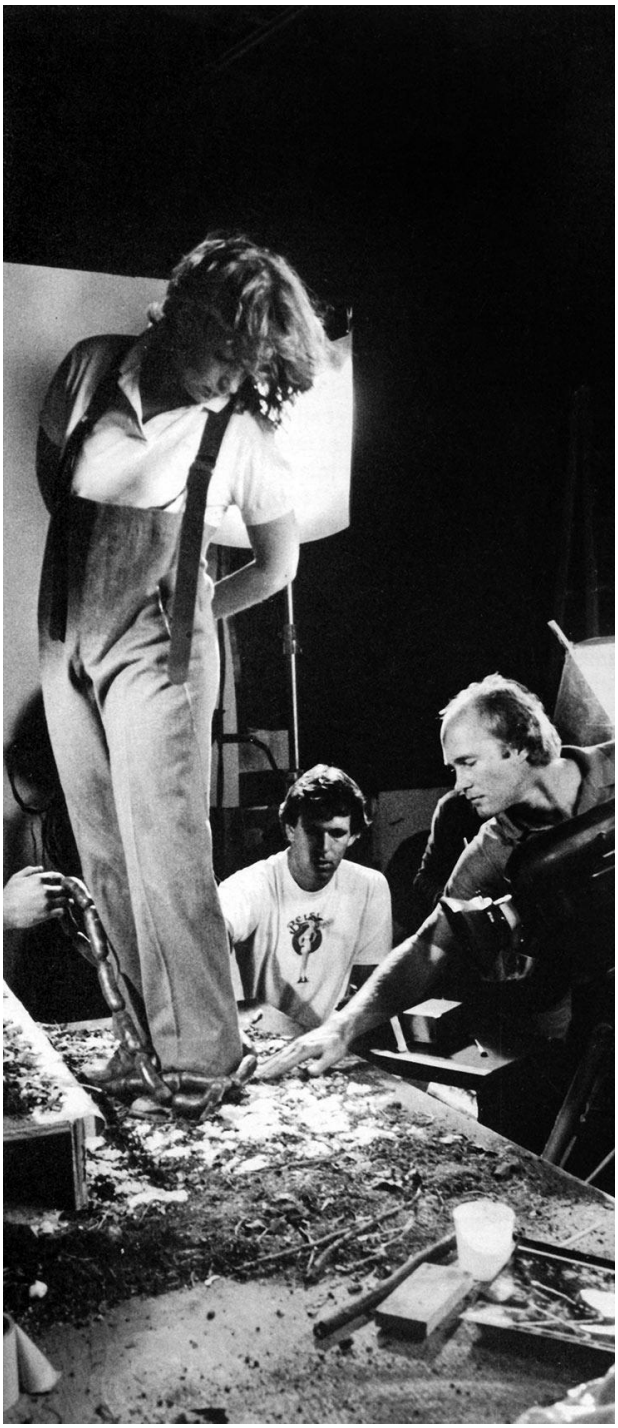
motion — onto the chisel. That was all it could do, so it couldn't really miss. The arm was pulled down by a monofiliment onto the chisel, and then it just sprang right back up. We wound up having to mold a hammer and chisel for the creature because real ones were just too heavy."

While Elizabeth's hallucination involved horrific creatures, the drug-induced ravings of Watson's mind had a more comical tone. Rushing headlong through the graveyard, Watson — already established as a lover of cream puffs — stumbles upon a crypt filled with pastries that suddenly and unaccountably come to life. But what at first seems like a dream come true soon becomes a nightmare as the sweets take on a more menacing demeanor.

In a film already running the gamut in terms of special effects techniques, Dennis Muren decided on yet another approach for producing the pastry sequence. "I decided to go with rod puppets — shot both bluescreen and live on the set — rather than stop-motion, because we would be able to do a lot of takes, get a lot of footage, and then go through and find the best ones in terms of action or comic effect. If we'd gone with stop-motion, we'd pretty much be stuck with what we got and that would be that. It's something we learned from shooting all those spaceships — shooting elements separately and then in editing assembling the best looking components of the shots. It's also something I learned from watching Steven Spielberg direct *E.T.* — you just get as many takes as possible on the mechanical stuff so that you'll have a lot to choose from." To supervise the sequence, Muren brought in David Allen. "Dave was sort of startled that he, with all his stop-motion background, was going to be working with rod puppets — something he'd never really done before. But Dave's got a really great sense of humor that I thought would come through on the food sequence. He wasn't really going to be doing the puppeteering anyway. I just wanted him there to supervise and to make sure that the guys got as much character out of the puppets as possible."

By the time Allen arrived at ILM, the thrust of the food sequence had been worked out between Levinson, Spielberg and Muren and storyboarded by ILM art director Dave Carson. "In the script," Carson related, "the description of Watson's hallucination was very brief — it was just 'food comes to life and pins Watson down.' I storyboarded a sequence; and Steven really enjoyed the idea of this food coming to life, so he suggested ways of expanding it. I wound up expanding it to the point that it was practically a ballet of food all over the place — with a potato leader and cream puffs jumping off walls and little jellybeans coming out of Watson's pockets. One of the things we had to decide was whether this sequence should basically be comedy relief or if it should be somewhat frightening. Once we decided to retain the comedy, I was free to design some real

As Watson spellboun sprout lim features a advance u technique to bring t foodstuffs prominen rod puppe through t a blue scr bases with spaced slo both a firm the charac predeterm action. / C puppeteer controls t cream puf steadies a upper bod Backgrour less comp operated l and photo



matching of the puppets with the live-a
film clip from the live-action into the vie
Allen related, "so that we could line ever
perspectives and make sure everybody w
the right point. The film clip holders in th
hundred percent accurate so there is alw
repositioning that is necessary. That v
responsibility — making sure everything
that the continuity was there. We were ve
shots so that they would play seamlessly
wasn't any need for cutaways or anythin
up being edited and shortened to the ext
wasn't retained anyway, so it didn't really
of the most difficult things we'd found
characters was giving each of them enc
things to do so that they didn't all seem
There was a limit to the kind of interacti
could walk or look around or relate to ea
but after a while it was very hard to come
of those things, especially with the sequ
originally. It's probably a good thing it
because the characters would have run

While the more active and complicate
produced through the bluescreen proce
cameraman Scott Farrar — some were
simply, shot live on the graveyard set p
England. "We went with shooting ma
live-action, just to fill in the sequence,"
absolutely *fill* the frame with these ch
want to do all of them bluescreen if we di
probably half the puppets you see in th
set, just worked by wires and rods and stu
about a dozen puppeteers pulling and n
was in there trying to paint the wires
live-action puppets in smoke, so in opti
bluescreen shots look like they were sho
the right flashing and diffusion and eve

"We had a variety of puppets for the
Allen elaborated. "Some were on wires
some were on rods and some were jus
Those with wires tended to be one-dire
decide what one thing you wanted the
pretty much it. But the way the picture
the takes are, I don't think these limi
attention is really more on the activ
bluescreened characters. I had feared
systems at work in the same shot mig
ent — like there was a species and a su
acters — but it didn't turn out to be a pr

high-con mattes off of them which were then bipacked over the painted street scene. It was similar to the technique we had used in *Indiana Jones and the Temple of Doom* for the shot of the alligators at the bottom of the gorge."

The matte department was required to fill in yet another shot depicting Victorian London and, incredibly, found a spot in the San Francisco suburb of Mill Valley that would, with some ingenious dressing, suffice as its double. "We started with some real buildings there that were appropriate to the time period," Barron recalled, "and filled in with a matte painting above the roof of one of the buildings and down toward the end of the street. At the end of the street you can see the San Francisco City Hall. Mike had looked at reference photos of London and the City Hall seemed to be the right architecture, so he just left it in. There was a liquor store across the street that had some old-style barrels and a wine corker displayed in the window. The owner's wife worked in commercials so he was sympathetic to our dilemma and he lent us the display. We made a water pump out of the wine corker, which helped conceal a parking meter that was there. The police were nice enough to unscrew the top of the meter for us and we put black tape on the rest of it and turned it into a hitching post or something like that. We also brought in some snow and put it on the sidewalks. Sherlock Holmes dashes in at the end of the scene and we used a double — actually Eric Christiansen of the modelshop crew. All we needed was someone tall in a black trench coat, because you don't actually see his face."

Although the *Young Sherlock Holmes* matte work presented some interesting challenges, it was the opinion of Chris Evans that much of the difficulties inherent in the project could have been allayed had his department been brought in from the outset rather than after the fact. "Whenever possible, the ILM matte department involves itself from the beginning, with the shot design and the plate photography and anything else we can do to help insure the optimum quality of our work. The *Sherlock Holmes* matte shots required a great deal of time and effort spent in resolving technical problems that wouldn't have been there if we'd been given the opportunity to offer our expertise at the beginning of the production rather than later, after the plates had already been shot."

Though Barry Levinson's vision of a film strong on character and subtle in effects was successfully realized, *Young Sherlock Holmes* employed a *variety* of cinematic techniques — everything from crude mechanical creatures to state-of-the-art computer technology — rarely explored within the confines of a single film. The result was a cornucopia of images achieved, not only through traditional and nontraditional means, but with imagination and a 'spirit of experimentation' that characterized the entire production. An Academy Award nomination for best